

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

**PM**

Low Impedance, High Reliability

series

- High reliability withstanding 5000 hour load life at +105°C (3000/2000 hours for smaller case sizes as specified below).
- Capacitance ranges available based on the numerical values in E12 series under JIS.
- Compliant to the RoHS directive (2011/65/EU).



Low Impedance Long Life

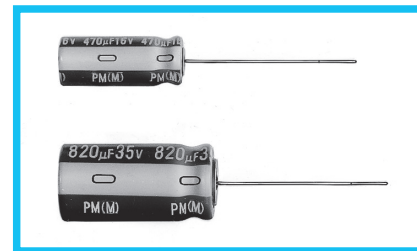


Anti-Solvent Feature  
(Through 100V only)

**PM**

Smaller

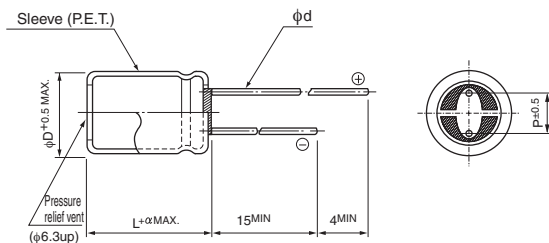
**PW**



## Specifications

| Item                          | Performance Characteristics                                                                                                                                                                                                                                                    |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------|------|---------|-----------|--------------------|----------------------------------------------------------------------------|------------|-----------|-----|
| Category Temperature Range    | -55 to +105°C (6.3 to 100V), -40 to +105°C (160 to 400V), -25 to +105°C (450V)                                                                                                                                                                                                 |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
| Rated Voltage Range           | 6.3 to 450V                                                                                                                                                                                                                                                                    |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
| Rated Capacitance Range       | 0.47 to 15000μF                                                                                                                                                                                                                                                                |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                                            |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
| Leakage Current               | Rated Voltage (V)                                                                                                                                                                                                                                                              | 6.3 to 100                                                                                                                      |          |      |         |           |                    | 160 to 450                                                                 |            |           |     |
|                               | Leakage current                                                                                                                                                                                                                                                                | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (μA), whichever is greater. |          |      |         |           |                    | CV ≤ 1000 : I = 0.1CV+40 (μA) max.<br>CV > 1000 : I = 0.04CV+100 (μA) max. |            |           |     |
| Tangent of loss angle (tan δ) | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz at 20°C                                                                                                                                                              |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |
|                               | Rated Voltage (V)                                                                                                                                                                                                                                                              | 6.3                                                                                                                             | 10       | 16   | 25      | 35        | 50                 | 63 to 100                                                                  | 160 to 350 | 400 · 450 |     |
|                               | tan δ (MAX.)                                                                                                                                                                                                                                                                   | 0.22                                                                                                                            | 0.19     | 0.16 | 0.14    | 0.12      | 0.10               | 0.08                                                                       | 0.20       | 0.25      |     |
| Stability at Low Temperature  | Rated voltage (V)                                                                                                                                                                                                                                                              |                                                                                                                                 | 6.3 · 10 | 16   | 25 · 35 | 50 to 100 | 160 · 200          | 250                                                                        | 315 · 350  | 400       | 450 |
|                               | Impedance ratio (MAX.)                                                                                                                                                                                                                                                         | Z-25°C / Z+20°C                                                                                                                 | —        | —    | —       | —         | —                  | —                                                                          | —          | —         | 15  |
|                               |                                                                                                                                                                                                                                                                                | Z-40°C / Z+20°C                                                                                                                 | —        | —    | —       | —         | 4                  | 6                                                                          | 8          | 10        | —   |
|                               |                                                                                                                                                                                                                                                                                | Z-55°C / Z+20°C                                                                                                                 | 4        | 3    | 3       | 2         | —                  | —                                                                          | —          | —         | —   |
| Endurance                     | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 5000 hours (2000 hours for φD=5 and 6.3, 3000 hours for φD=8) at 105°C, the peak voltage shall not exceed the rated voltage. |                                                                                                                                 |          |      |         |           | Capacitance change | Within ±20% of the initial capacitance value                               |            |           |     |
|                               |                                                                                                                                                                                                                                                                                |                                                                                                                                 |          |      |         |           | tan δ              | 200% or less than the initial specified value                              |            |           |     |
|                               |                                                                                                                                                                                                                                                                                |                                                                                                                                 |          |      |         |           | Leakage current    | Less than or equal to the initial specified value                          |            |           |     |
| Shelf Life                    | After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right.                                                            |                                                                                                                                 |          |      |         |           | Capacitance change | Within ±20% of the initial capacitance value                               |            |           |     |
|                               |                                                                                                                                                                                                                                                                                |                                                                                                                                 |          |      |         |           | tan δ              | 150% or less than the initial specified value                              |            |           |     |
|                               |                                                                                                                                                                                                                                                                                |                                                                                                                                 |          |      |         |           | Leakage current    | Less than or equal to the initial specified value                          |            |           |     |
| Marking                       | Printed with white color letter on dark brown sleeve.                                                                                                                                                                                                                          |                                                                                                                                 |          |      |         |           |                    |                                                                            |            |           |     |

## Radial Lead Type



|   |               |
|---|---------------|
| α | (φD < 10) 1.5 |
|   | (φD ≥ 10) 2.0 |

|    | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|----|-----|-----|-----|-----|------|-----|-----|
| φD | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
| P  | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6* | 0.8 | 0.8 |

※ In case L > 25 for the φ12.5 dia. unit, lead dia. φd = 0.8mm.

- Please refer to page 20 about the end seal configuration.

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

- Dimension table in next page.

## Type numbering system (Example : 25V 470µF)

|   |   |   |   |   |   |   |   |   |                              |    |    |
|---|---|---|---|---|---|---|---|---|------------------------------|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                           | 11 | 12 |
| U | P | M | 1 | E | 4 | 7 | 1 | M | P                            | D  |    |
|   |   |   |   |   |   |   |   |   | Configuration ※              |    |    |
|   |   |   |   |   |   |   |   |   | Capacitance tolerance (±20%) |    |    |
|   |   |   |   |   |   |   |   |   | Rated capacitance (470µF)    |    |    |
|   |   |   |   |   |   |   |   |   | Rated voltage (25V)          |    |    |
|   |   |   |   |   |   |   |   |   | Series name                  |    |    |
|   |   |   |   |   |   |   |   |   | Type                         |    |    |

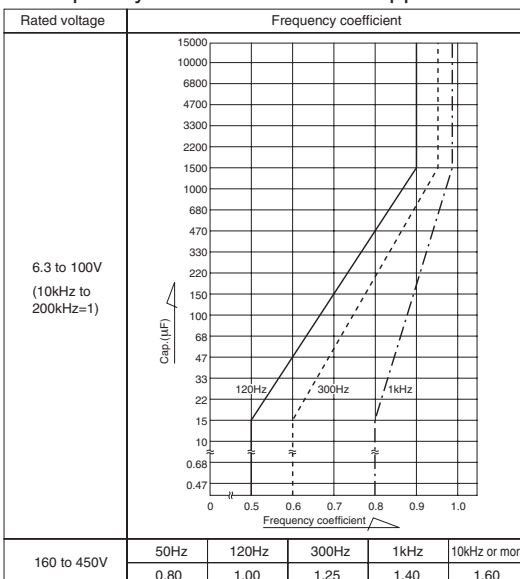
### ※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|----------------------------------------|
| 5          | DD                                     |
| 6.3        | ED                                     |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |

Size code

| Type        | Code |
|-------------|------|
| Small Dia   | —    |
| Low Profile | 6    |

## Frequency coefficient of rated ripple current



CAT.8100D

## ■ Dimensions

φ D × L (mm)

| Cap.(μF) | Code | V(Code)<br>Size code |           | 6.3 (0J) |             | 10 (1A)   |   | 16 (1C)     |           | 25 (1E)     |           | 35 (1V)     |           |
|----------|------|----------------------|-----------|----------|-------------|-----------|---|-------------|-----------|-------------|-----------|-------------|-----------|
|          |      | —                    | 6         | —        | 6           | —         | 6 | —           | 6         | —           | 6         | —           | 6         |
| 22       | 220  |                      |           |          |             |           |   |             |           |             |           | 5 × 11      |           |
| 27       | 270  |                      |           |          |             |           |   |             |           |             |           | 5 × 11      |           |
| 33       | 330  |                      |           |          |             |           |   |             |           | 5 × 11      |           | 6.3 × 11    |           |
| 39       | 390  |                      |           |          |             |           |   |             |           | 5 × 11      |           | 6.3 × 11    |           |
| 47       | 470  |                      |           |          |             |           |   | 5 × 11      |           | 6.3 × 11    |           | 6.3 × 11    |           |
| 56       | 560  |                      |           |          |             |           |   | 5 × 11      |           | 6.3 × 11    |           | 6.3 × 11    |           |
| 68       | 680  |                      |           |          | 5 × 11      |           |   | 6.3 × 11    |           | 6.3 × 11    |           | 6.3 × 15    |           |
| 82       | 820  |                      |           |          | 5 × 11      |           |   | 6.3 × 11    |           | 6.3 × 11    |           | 6.3 × 15    |           |
| 100      | 101  | 5 × 11               |           |          | 6.3 × 11    |           |   | 6.3 × 11    |           | 6.3 × 15    |           | 8 × 11.5    |           |
| 120      | 121  | 5 × 11               |           |          | 6.3 × 11    |           |   | 6.3 × 11    |           | 6.3 × 15    |           | 8 × 15      | 10 × 12.5 |
| 150      | 151  | 6.3 × 11             |           |          | 6.3 × 11    |           |   | 6.3 × 15    |           | 8 × 11.5    |           | 8 × 15      | 10 × 12.5 |
| 180      | 181  | 6.3 × 11             |           |          | 6.3 × 11    |           |   | 6.3 × 15    |           | 8 × 15      | 10 × 12.5 | 8 × 20      | 10 × 15   |
| 220      | 221  | 6.3 × 11             |           |          | 6.3 × 15    |           |   | 8 × 11.5    |           | 8 × 15      | 10 × 12.5 | 8 × 20      | 10 × 15   |
| 270      | 271  | 6.3 × 15             |           |          | 6.3 × 15    |           |   | 8 × 15      | 10 × 12.5 | 8 × 20      | 10 × 15   | 10 × 20     | 12.5 × 15 |
| 330      | 331  | 6.3 × 15             |           |          | 8 × 11.5    |           |   | 8 × 15      | 10 × 12.5 | 8 × 20      | 10 × 15   | 10 × 20     | 12.5 × 15 |
| 390      | 391  | 8 × 11.5             |           |          | 8 × 15      | 10 × 12.5 |   | 8 × 20      | 10 × 15   | 10 × 20     | 12.5 × 15 | 10 × 25     | 12.5 × 15 |
| 470      | 471  | 8 × 15               | 10 × 12.5 |          | 8 × 15      | 10 × 12.5 |   | 8 × 20      | 10 × 15   | 10 × 20     | 12.5 × 15 | 10 × 31.5   | 16 × 15   |
| 560      | 561  | 8 × 15               | 10 × 12.5 |          | 8 × 20      | 10 × 15   |   | 10 × 20     | 12.5 × 15 | 10 × 25     | 12.5 × 15 | 12.5 × 20   | 16 × 15   |
| 680      | 681  | 8 × 20               | 10 × 15   |          | 8 × 20      | 10 × 15   |   | 10 × 20     | 12.5 × 15 | 10 × 31.5   | 16 × 15   | 12.5 × 25   | 18 × 15   |
| 820      | 821  | 8 × 20               | 10 × 15   |          | 10 × 20     | 12.5 × 15 |   | 10 × 25     | 12.5 × 15 | 12.5 × 20   | 16 × 15   | 12.5 × 25   | 18 × 15   |
| 1000     | 102  | 10 × 20              | 12.5 × 15 |          | 10 × 20     | 12.5 × 15 |   | 10 × 31.5   | 16 × 15   | 12.5 × 25   | 18 × 15   | 12.5 × 31.5 | 16 × 20   |
| 1200     | 122  | 10 × 20              | 12.5 × 15 |          | 10 × 25     | 12.5 × 15 |   | 12.5 × 20   | 16 × 15   | 12.5 × 25   | 18 × 15   | 12.5 × 35.5 | 16 × 25   |
| 1500     | 152  | 10 × 25              | 12.5 × 15 |          | 10 × 31.5   | 16 × 15   |   | 12.5 × 25   | 18 × 15   | 12.5 × 31.5 | 16 × 20   | 12.5 × 40   | 18 × 20   |
| 1800     | 182  | 10 × 31.5            | 16 × 15   |          | 12.5 × 20   | 16 × 15   |   | 12.5 × 31.5 | 16 × 20   | 12.5 × 35.5 | 16 × 25   | 16 × 31.5   | 18 × 25   |
| 2200     | 222  | 10 × 31.5            | 16 × 15   |          | 12.5 × 25   | 18 × 15   |   | 12.5 × 31.5 | 16 × 20   | 12.5 × 40   | 18 × 20   | 16 × 35.5   | 18 × 31.5 |
| 2700     | 272  | 12.5 × 25            | 18 × 15   |          | 12.5 × 31.5 | 16 × 20   |   | 12.5 × 35.5 | 16 × 25   | 16 × 31.5   | 18 × 25   | 16 × 40     | 18 × 35.5 |
| 3300     | 332  | 12.5 × 25            | 18 × 15   |          | 12.5 × 35.5 | 16 × 20   |   | 12.5 × 40   | 18 × 20   | 16 × 35.5   | 18 × 31.5 | 18 × 40     |           |
| 3900     | 392  | 12.5 × 31.5          | 16 × 20   |          | 12.5 × 40   | 18 × 20   |   | 16 × 31.5   | 18 × 25   | 16 × 40     | 18 × 35.5 |             |           |
| 4700     | 472  | 12.5 × 35.5          | 18 × 20   |          | 16 × 31.5   | 18 × 25   |   | 16 × 35.5   | 18 × 31.5 | 18 × 40     |           |             |           |
| 5600     | 562  | 12.5 × 40            | 18 × 20   |          | 16 × 35.5   | 18 × 25   |   | 16 × 40     | 18 × 35.5 |             |           |             |           |
| 6800     | 682  | 16 × 31.5            | 18 × 25   |          | 16 × 35.5   | 18 × 31.5 |   | 18 × 35.5   |           |             |           |             |           |
| 8200     | 822  | 16 × 35.5            | 18 × 31.5 |          | 16 × 40     | 18 × 35.5 |   | 18 × 40     |           |             |           |             |           |
| 10000    | 103  | 16 × 40              | 18 × 31.5 |          | 18 × 40     |           |   |             |           |             |           |             |           |
| 12000    | 123  | 18 × 35.5            |           |          |             |           |   |             |           |             |           |             |           |
| 15000    | 153  | 18 × 40              |           |          |             |           |   |             |           |             |           |             |           |

| Cap.(μF) | Code | V(Code)<br>Size code |           | 50 (1H) |             | 63 (1J)   |   | 80 (1K)     |           | 100 (2A)    |           |
|----------|------|----------------------|-----------|---------|-------------|-----------|---|-------------|-----------|-------------|-----------|
|          |      | —                    | 6         | —       | 6           | —         | 6 | —           | 6         | —           | 6         |
| 0.47     | R47  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 0.68     | R68  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 1        | 010  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 1.5      | 1R5  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 2.2      | 2R2  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 3.3      | 3R3  | 5 × 11               |           |         |             |           |   |             |           | 5 × 11      |           |
| 4.7      | 4R7  | 5 × 11               |           |         |             |           |   | 5 × 11      |           | 6.3 × 11    |           |
| 6.8      | 6R8  | 5 × 11               |           |         |             |           |   | 5 × 11      |           | 6.3 × 11    |           |
| 10       | 100  | 5 × 11               |           |         | 5 × 11      |           |   | 6.3 × 11    |           | 6.3 × 11    |           |
| 12       | 120  | 5 × 11               |           |         | 5 × 11      |           |   | 6.3 × 11    |           | 6.3 × 11    |           |
| 15       | 150  | 5 × 11               |           |         | 6.3 × 11    |           |   | 6.3 × 11    |           | 6.3 × 15    |           |
| 18       | 180  | 5 × 11               |           |         | 6.3 × 11    |           |   | 6.3 × 11    |           | 6.3 × 15    |           |
| 22       | 220  | 6.3 × 11             |           |         | 6.3 × 11    |           |   | 6.3 × 15    |           | 8 × 11.5    |           |
| 27       | 270  | 6.3 × 11             |           |         | 6.3 × 11    |           |   | 6.3 × 15    |           | 8 × 15      | 10 × 12.5 |
| 33       | 330  | 6.3 × 11             |           |         | 6.3 × 15    |           |   | 8 × 11.5    |           | 8 × 15      | 10 × 12.5 |
| 39       | 390  | 6.3 × 11             |           |         | 6.3 × 15    |           |   | 8 × 15      | 10 × 12.5 | 8 × 20      | 10 × 15   |
| 47       | 470  | 6.3 × 15             |           |         | 8 × 11.5    |           |   | 8 × 15      | 10 × 12.5 | 10 × 20     | 12.5 × 15 |
| 56       | 560  | 6.3 × 15             |           |         | 8 × 15      | 10 × 12.5 |   | 8 × 20      | 10 × 15   | 10 × 20     | 12.5 × 15 |
| 68       | 680  | 8 × 11.5             |           |         | 8 × 15      | 10 × 12.5 |   | 10 × 20     | 12.5 × 15 | 10 × 25     | 12.5 × 15 |
| 82       | 820  | 8 × 15               | 10 × 12.5 |         | 8 × 20      | 10 × 15   |   | 10 × 20     | 12.5 × 15 | 10 × 31.5   | 16 × 15   |
| 100      | 101  | 8 × 20               | 10 × 15   |         | 10 × 20     | 12.5 × 15 |   | 10 × 25     | 12.5 × 15 | 10 × 31.5   | 16 × 15   |
| 120      | 121  | 8 × 20               | 10 × 15   |         | 10 × 20     | 12.5 × 15 |   | 10 × 31.5   | 16 × 15   | 12.5 × 25   | 16 × 15   |
| 150      | 151  | 10 × 20              | 12.5 × 15 |         | 10 × 25     | 12.5 × 15 |   | 10 × 31.5   | 16 × 15   | 12.5 × 25   | 18 × 15   |
| 180      | 181  | 10 × 20              | 12.5 × 15 |         | 10 × 31.5   | 16 × 15   |   | 12.5 × 25   | 16 × 15   | 12.5 × 31.5 | 16 × 20   |
| 220      | 221  | 10 × 25              | 12.5 × 15 |         | 12.5 × 20   | 16 × 15   |   | 12.5 × 31.5 | 18 × 15   | 12.5 × 35.5 | 16 × 25   |
| 270      | 271  | 10 × 31.5            | 16 × 15   |         | 12.5 × 25   | 18 × 15   |   | 12.5 × 31.5 | 16 × 20   | 12.5 × 40   | 18 × 20   |
| 330      | 331  | 10 × 31.5            | 16 × 15   |         | 12.5 × 25   | 18 × 15   |   | 12.5 × 35.5 | 16 × 25   | 16 × 31.5   | 18 × 25   |
| 390      | 391  | 12.5 × 25            | 16 × 15   |         | 12.5 × 31.5 | 18 × 20   |   | 12.5 × 40   | 18 × 20   | 16 × 35.5   | 18 × 31.5 |
| 470      | 471  | 12.5 × 25            | 18 × 15   |         | 12.5 × 35.5 | 16 × 25   |   | 16 × 31.5   | 18 × 25   | 16 × 40     | 18 × 35.5 |
| 560      | 561  | 12.5 × 31.5          | 16 × 20   |         | 12.5 × 40   | 18 × 20   |   | 16 × 35.5   | 18 × 31.5 | 18 × 35.5   |           |
| 680      | 681  | 12.5 × 35.5          | 16 × 20   |         | 16 × 31.5   | 18 × 25   |   | 16 × 40     | 18 × 31.5 | 18 × 40     |           |
| 820      | 821  | 12.5 × 40            | 18 × 20   |         | 16 × 35.5   | 18 × 31.5 |   | 18 × 35.5   |           |             |           |
| 1000     | 102  | 16 × 31.5            | 18 × 25   |         | 16 × 40     | 18 × 35.5 |   | 18 × 40     |           |             |           |
| 1200     | 122  | 16 × 35.5            | 18 × 31.5 |         | 18 × 40     |           |   |             |           |             |           |
| 1500     | 152  | 16 × 40              | 18 × 31.5 |         |             |           |   |             |           |             |           |
| 1800     | 182  | 18 × 35.5            |           |         |             |           |   |             |           |             |           |
| 2200     | 222  | 18 × 40              |           |         |             |           |   |             |           |             |           |

※In case of low profile type, [6] will be put at 12th digit of type numbering system.

Dimension table for 160 to 450V products are shown in 204 page.

| Cap. (μF) | V(Code)<br>Size code<br>Item<br>Code | 10 (1A)                     |                   |                |                             |               |                             |                    |                |                             |               |
|-----------|--------------------------------------|-----------------------------|-------------------|----------------|-----------------------------|---------------|-----------------------------|--------------------|----------------|-----------------------------|---------------|
|           |                                      | —                           |                   |                |                             |               | 6                           |                    |                |                             |               |
|           |                                      | Case size<br>φD × L<br>(mm) | Impedance (Ω)MAX. |                | Rated ripple (mArms)        |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)        |               |
|           |                                      |                             | 20°C / 100kHz     | ~10°C / 100kHz | 105°C / 100kHz to<br>200kHz | 105°C / 120Hz |                             | 20°C / 100kHz      | ~10°C / 100kHz | 105°C / 100kHz to<br>200kHz | 105°C / 120Hz |
| 68        | 680                                  | 5 × 11                      | 0.80              | 1.60           | 155                         | 97            |                             |                    |                |                             |               |
| 82        | 820                                  | 5 × 11                      | 0.65              | 1.30           | 175                         | 110           |                             |                    |                |                             |               |
| 100       | 101                                  | 6.3 × 11                    | 0.55              | 1.10           | 210                         | 135           |                             |                    |                |                             |               |
| 120       | 121                                  | 6.3 × 11                    | 0.44              | 0.88           | 235                         | 160           |                             |                    |                |                             |               |
| 150       | 151                                  | 6.3 × 11                    | 0.35              | 0.70           | 265                         | 185           |                             |                    |                |                             |               |
| 180       | 181                                  | 6.3 × 11                    | 0.29              | 0.58           | 290                         | 205           |                             |                    |                |                             |               |
| 220       | 221                                  | 6.3 × 15                    | 0.24              | 0.48           | 370                         | 270           |                             |                    |                |                             |               |
| 270       | 271                                  | 6.3 × 15                    | 0.20              | 0.40           | 405                         | 300           |                             |                    |                |                             |               |
| 330       | 331                                  | 8 × 11.5                    | 0.16              | 0.32           | 460                         | 350           |                             |                    |                |                             |               |
| 390       | 391                                  | 8 × 15                      | 0.14              | 0.28           | 550                         | 430           | 10 × 12.5                   | 0.15               | 0.30           | 635                         | 430           |
| 470       | 471                                  | 8 × 15                      | 0.12              | 0.24           | 595                         | 475           | 10 × 12.5                   | 0.13               | 0.26           | 670                         | 475           |
| 560       | 561                                  | 8 × 20                      | 0.10              | 0.20           | 730                         | 590           | 10 × 15                     | 0.11               | 0.22           | 700                         | 565           |
| 680       | 681                                  | 8 × 20                      | 0.085             | 0.17           | 795                         | 660           | 10 × 15                     | 0.090              | 0.18           | 825                         | 635           |
| 820       | 821                                  | 10 × 20                     | 0.070             | 0.14           | 985                         | 835           | 12.5 × 15                   | 0.080              | 0.16           | 920                         | 780           |
| 1000      | 102                                  | 10 × 20                     | 0.060             | 0.12           | 1060                        | 915           | 12.5 × 15                   | 0.065              | 0.13           | 1040                        | 895           |
| 1200      | 122                                  | 10 × 25                     | 0.050             | 0.10           | 1260                        | 1120          | 12.5 × 15                   | 0.060              | 0.12           | 1060                        | 930           |
| 1500      | 152                                  | 10 × 31.5                   | 0.045             | 0.090          | 1450                        | 1290          | 16 × 15                     | 0.050              | 0.10           | 1330                        | 1190          |
| 1800      | 182                                  | 12.5 × 20                   | 0.039             | 0.078          | 1470                        | 1320          | 16 × 15                     | 0.044              | 0.088          | 1420                        | 1270          |
| 2200      | 222                                  | 12.5 × 25                   | 0.034             | 0.068          | 1710                        | 1530          | 18 × 15                     | 0.039              | 0.078          | 1600                        | 1440          |
| 2700      | 272                                  | 12.5 × 31.5                 | 0.030             | 0.060          | 1980                        | 1740          | 16 × 20                     | 0.035              | 0.070          | 1740                        | 1560          |
| 3300      | 332                                  | 12.5 × 35.5                 | 0.026             | 0.052          | 2230                        | 1960          | 16 × 20                     | 0.031              | 0.062          | 1850                        | 1660          |
| 3900      | 392                                  | 12.5 × 40                   | 0.024             | 0.048          | 2460                        | 2120          | 18 × 20                     | 0.028              | 0.056          | 2050                        | 1840          |
| 4700      | 472                                  | 16 × 31.5                   | 0.023             | 0.046          | 2420                        | 2170          | 18 × 25                     | 0.026              | 0.052          | 2350                        | 2020          |
| 5600      | 562                                  | 16 × 35.5                   | 0.021             | 0.042          | 2610                        | 2340          | 18 × 25                     | 0.024              | 0.048          | 2440                        | 2100          |
| 6800      | 682                                  | 16 × 35.5                   | 0.020             | 0.040          | 2770                        | 2410          | 18 × 31.5                   | 0.022              | 0.044          | 2720                        | 2280          |
| 8200      | 822                                  | 16 × 40                     | 0.019             | 0.038          | 3110                        | 2530          | 18 × 35.5                   | 0.021              | 0.042          | 3050                        | 2420          |
| 10000     | 103                                  | 18 × 40                     | 0.017             | 0.034          | 3300                        | 2730          |                             |                    |                |                             |               |

※ In case of low profile type, 6 will be put at 12th digit of type numbering system.

## ■ Standard Ratings

| <div> <div>V(Code)</div> <div>Size Code</div> <div>Item</div> <div>Code</div> </div> <div>Cap.(μF)</div> |     | 16 (1C)                     |                    |                |                                               |               |                             |                    |                |                                               |               |
|----------------------------------------------------------------------------------------------------------|-----|-----------------------------|--------------------|----------------|-----------------------------------------------|---------------|-----------------------------|--------------------|----------------|-----------------------------------------------|---------------|
|                                                                                                          |     | —                           |                    |                |                                               |               | 6                           |                    |                |                                               |               |
|                                                                                                          |     | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)                          |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)                          |               |
|                                                                                                          |     |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / <sup>10kHz to</sup> <sub>200kHz</sub> | 105°C / 120Hz |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / <sup>10kHz to</sup> <sub>200kHz</sub> | 105°C / 120Hz |
| 47                                                                                                       | 470 | 5 × 11                      | 0.80               | 1.60           | 155                                           | 92            |                             |                    |                |                                               |               |
| 56                                                                                                       | 560 | 5 × 11                      | 0.65               | 1.30           | 175                                           | 105           |                             |                    |                |                                               |               |
| 68                                                                                                       | 680 | 6.3 × 11                    | 0.50               | 1.00           | 220                                           | 135           |                             |                    |                |                                               |               |
| 82                                                                                                       | 820 | 6.3 × 11                    | 0.42               | 0.84           | 240                                           | 155           |                             |                    |                |                                               |               |
| 100                                                                                                      | 101 | 6.3 × 11                    | 0.35               | 0.70           | 265                                           | 175           |                             |                    |                |                                               |               |
| 120                                                                                                      | 121 | 6.3 × 11                    | 0.29               | 0.58           | 290                                           | 195           |                             |                    |                |                                               |               |
| 150                                                                                                      | 151 | 6.3 × 15                    | 0.23               | 0.46           | 375                                           | 260           |                             |                    |                |                                               |               |
| 180                                                                                                      | 181 | 6.3 × 15                    | 0.20               | 0.40           | 405                                           | 285           |                             |                    |                |                                               |               |
| 220                                                                                                      | 221 | 8 × 11.5                    | 0.16               | 0.32           | 460                                           | 335           |                             |                    |                |                                               |               |
| 270                                                                                                      | 271 | 8 × 15                      | 0.14               | 0.28           | 550                                           | 410           | 10 × 12.5                   | 0.14               | 0.28           | 635                                           | 430           |
| 330                                                                                                      | 331 | 8 × 15                      | 0.12               | 0.24           | 595                                           | 455           | 10 × 12.5                   | 0.12               | 0.24           | 670                                           | 480           |
| 390                                                                                                      | 391 | 8 × 20                      | 0.10               | 0.20           | 730                                           | 570           | 10 × 15                     | 0.10               | 0.20           | 730                                           | 570           |
| 470                                                                                                      | 471 | 8 × 20                      | 0.090              | 0.18           | 770                                           | 615           | 10 × 15                     | 0.090              | 0.18           | 825                                           | 615           |
| 560                                                                                                      | 561 | 10 × 20                     | 0.075              | 0.15           | 950                                           | 770           | 12.5 × 15                   | 0.080              | 0.16           | 920                                           | 745           |
| 680                                                                                                      | 681 | 10 × 20                     | 0.065              | 0.13           | 1060                                          | 845           | 12.5 × 15                   | 0.070              | 0.14           | 985                                           | 815           |
| 820                                                                                                      | 821 | 10 × 25                     | 0.055              | 0.11           | 1260                                          | 1030          | 12.5 × 15                   | 0.060              | 0.12           | 1060                                          | 895           |
| 1000                                                                                                     | 102 | 10 × 31.5                   | 0.047              | 0.094          | 1410                                          | 1210          | 16 × 15                     | 0.055              | 0.11           | 1270                                          | 1090          |
| 1200                                                                                                     | 122 | 12.5 × 20                   | 0.041              | 0.082          | 1430                                          | 1250          | 16 × 15                     | 0.046              | 0.092          | 1390                                          | 1220          |
| 1500                                                                                                     | 152 | 12.5 × 25                   | 0.036              | 0.072          | 1700                                          | 1490          | 18 × 15                     | 0.041              | 0.082          | 1560                                          | 1400          |
| 1800                                                                                                     | 182 | 12.5 × 31.5                 | 0.032              | 0.064          | 1880                                          | 1690          | 16 × 20                     | 0.037              | 0.074          | 1700                                          | 1530          |
| 2200                                                                                                     | 222 | 12.5 × 31.5                 | 0.028              | 0.056          | 2010                                          | 1800          | 16 × 20                     | 0.033              | 0.066          | 1800                                          | 1620          |
| 2700                                                                                                     | 272 | 12.5 × 35.5                 | 0.025              | 0.050          | 2230                                          | 1990          | 16 × 25                     | 0.030              | 0.060          | 2190                                          | 1800          |
| 3300                                                                                                     | 332 | 12.5 × 40                   | 0.023              | 0.046          | 2460                                          | 2160          | 18 × 20                     | 0.027              | 0.054          | 2090                                          | 1880          |
| 3900                                                                                                     | 392 | 16 × 31.5                   | 0.022              | 0.044          | 2510                                          | 2220          | 18 × 25                     | 0.025              | 0.050          | 2350                                          | 2060          |
| 4700                                                                                                     | 472 | 16 × 35.5                   | 0.020              | 0.040          | 2770                                          | 2410          | 18 × 31.5                   | 0.023              | 0.046          | 2720                                          | 2240          |
| 5600                                                                                                     | 562 | 16 × 40                     | 0.019              | 0.038          | 3110                                          | 2530          | 18 × 35.5                   | 0.022              | 0.044          | 2620                                          | 2350          |
| 6800                                                                                                     | 682 | 18 × 35.5                   | 0.018              | 0.036          | 3050                                          | 2610          |                             |                    |                |                                               |               |
| 8200                                                                                                     | 822 | 18 × 40                     | 0.017              | 0.034          | 3300                                          | 2730          |                             |                    |                |                                               |               |

| <div> <div>V(Code)</div> <div>Size Code</div> <div>Item</div> <div>Code</div> </div> <div>Cap.(μF)</div> |     | 25 (1E)                     |                    |                |                                               |               |                             |                    |                |                                               |               |
|----------------------------------------------------------------------------------------------------------|-----|-----------------------------|--------------------|----------------|-----------------------------------------------|---------------|-----------------------------|--------------------|----------------|-----------------------------------------------|---------------|
|                                                                                                          |     | —                           |                    |                |                                               |               | 6                           |                    |                |                                               |               |
|                                                                                                          |     | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)                          |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)                          |               |
|                                                                                                          |     |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / <sup>10kHz to</sup> <sub>200kHz</sub> | 105°C / 120Hz |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / <sup>10kHz to</sup> <sub>200kHz</sub> | 105°C / 120Hz |
| 33                                                                                                       | 330 | 5 × 11                      | 0.80               | 1.60           | 155                                           | 88            |                             |                    |                |                                               |               |
| 39                                                                                                       | 390 | 5 × 11                      | 0.65               | 1.30           | 175                                           | 100           |                             |                    |                |                                               |               |
| 47                                                                                                       | 470 | 6.3 × 11                    | 0.55               | 1.10           | 210                                           | 125           |                             |                    |                |                                               |               |
| 56                                                                                                       | 560 | 6.3 × 11                    | 0.44               | 0.88           | 235                                           | 140           |                             |                    |                |                                               |               |
| 68                                                                                                       | 680 | 6.3 × 11                    | 0.36               | 0.72           | 260                                           | 160           |                             |                    |                |                                               |               |
| 82                                                                                                       | 820 | 6.3 × 11                    | 0.30               | 0.60           | 285                                           | 180           |                             |                    |                |                                               |               |
| 100                                                                                                      | 101 | 6.3 × 15                    | 0.24               | 0.48           | 370                                           | 245           |                             |                    |                |                                               |               |
| 120                                                                                                      | 121 | 6.3 × 15                    | 0.20               | 0.40           | 405                                           | 275           |                             |                    |                |                                               |               |
| 150                                                                                                      | 151 | 8 × 11.5                    | 0.16               | 0.32           | 460                                           | 320           |                             |                    |                |                                               |               |
| 180                                                                                                      | 181 | 8 × 15                      | 0.14               | 0.28           | 550                                           | 390           | 10 × 12.5                   | 0.15               | 0.30           | 635                                           | 395           |
| 220                                                                                                      | 221 | 8 × 15                      | 0.11               | 0.22           | 625                                           | 455           | 10 × 12.5                   | 0.13               | 0.26           | 670                                           | 435           |
| 270                                                                                                      | 271 | 8 × 20                      | 0.095              | 0.19           | 750                                           | 560           | 10 × 15                     | 0.11               | 0.22           | 700                                           | 525           |
| 330                                                                                                      | 331 | 8 × 20                      | 0.085              | 0.17           | 795                                           | 610           | 10 × 15                     | 0.095              | 0.19           | 825                                           | 575           |
| 390                                                                                                      | 391 | 10 × 20                     | 0.070              | 0.14           | 985                                           | 770           | 12.5 × 15                   | 0.080              | 0.16           | 920                                           | 720           |
| 470                                                                                                      | 471 | 10 × 20                     | 0.065              | 0.13           | 1060                                          | 810           | 12.5 × 15                   | 0.070              | 0.14           | 985                                           | 785           |
| 560                                                                                                      | 561 | 10 × 25                     | 0.055              | 0.11           | 1260                                          | 990           | 12.5 × 15                   | 0.060              | 0.12           | 1060                                          | 860           |
| 680                                                                                                      | 681 | 10 × 31.5                   | 0.046              | 0.092          | 1420                                          | 1180          | 16 × 15                     | 0.055              | 0.11           | 1270                                          | 1050          |
| 820                                                                                                      | 821 | 12.5 × 20                   | 0.041              | 0.082          | 1440                                          | 1210          | 16 × 15                     | 0.049              | 0.098          | 1340                                          | 1130          |
| 1000                                                                                                     | 102 | 12.5 × 25                   | 0.036              | 0.072          | 1700                                          | 1430          | 18 × 15                     | 0.043              | 0.086          | 1520                                          | 1310          |
| 1200                                                                                                     | 122 | 12.5 × 25                   | 0.032              | 0.064          | 1760                                          | 1550          | 18 × 15                     | 0.039              | 0.078          | 1600                                          | 1400          |
| 1500                                                                                                     | 152 | 12.5 × 31.5                 | 0.029              | 0.058          | 1980                                          | 1780          | 16 × 20                     | 0.034              | 0.068          | 1770                                          | 1590          |
| 1800                                                                                                     | 182 | 12.5 × 35.5                 | 0.026              | 0.052          | 2230                                          | 1960          | 16 × 25                     | 0.031              | 0.062          | 2190                                          | 1780          |
| 2200                                                                                                     | 222 | 12.5 × 40                   | 0.024              | 0.048          | 2460                                          | 2120          | 18 × 20                     | 0.028              | 0.056          | 2050                                          | 1840          |
| 2700                                                                                                     | 272 | 16 × 31.5                   | 0.022              | 0.044          | 2510                                          | 2220          | 18 × 25                     | 0.025              | 0.050          | 2350                                          | 2060          |
| 3300                                                                                                     | 332 | 16 × 35.5                   | 0.020              | 0.040          | 2770                                          | 2410          | 18 × 31.5                   | 0.023              | 0.046          | 2720                                          | 2240          |
| 3900                                                                                                     | 392 | 16 × 40                     | 0.019              | 0.038          | 3110                                          | 2530          | 18 × 35.5                   | 0.021              | 0.042          | 3050                                          | 2420          |
| 4700                                                                                                     | 472 | 18 × 40                     | 0.018              | 0.036          | 3300                                          | 2660          |                             |                    |                |                                               |               |

※ In case of low profile type, [6] will be put at 12th digit of type numbering system.



## ■ Standard Ratings

| Cap.(μF) | V(Code) | Size code   | 35 (1V) |                             |                    |                |                            |               |                             |                    |                |                            |               |
|----------|---------|-------------|---------|-----------------------------|--------------------|----------------|----------------------------|---------------|-----------------------------|--------------------|----------------|----------------------------|---------------|
|          |         |             | Item    | —                           |                    |                |                            | 6             |                             |                    |                |                            |               |
|          |         |             |         | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)       |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)       |               |
|          |         |             |         |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |
| 22       | 220     | 5 × 11      | 0.75    | 1.50                        | 160                | 85             |                            |               |                             |                    |                |                            |               |
| 27       | 270     | 5 × 11      | 0.60    | 1.20                        | 180                | 99             |                            |               |                             |                    |                |                            |               |
| 33       | 330     | 6.3 × 11    | 0.49    | 0.98                        | 225                | 125            |                            |               |                             |                    |                |                            |               |
| 39       | 390     | 6.3 × 11    | 0.41    | 0.82                        | 245                | 140            |                            |               |                             |                    |                |                            |               |
| 47       | 470     | 6.3 × 11    | 0.34    | 0.68                        | 270                | 160            |                            |               |                             |                    |                |                            |               |
| 56       | 560     | 6.3 × 11    | 0.28    | 0.56                        | 295                | 180            |                            |               |                             |                    |                |                            |               |
| 68       | 680     | 6.3 × 15    | 0.24    | 0.48                        | 370                | 230            |                            |               |                             |                    |                |                            |               |
| 82       | 820     | 6.3 × 15    | 0.19    | 0.38                        | 415                | 265            |                            |               |                             |                    |                |                            |               |
| 100      | 101     | 8 × 11.5    | 0.16    | 0.32                        | 460                | 305            |                            |               |                             |                    |                |                            |               |
| 120      | 121     | 8 × 15      | 0.14    | 0.28                        | 550                | 370            | 10 × 12.5                  | 0.15          | 0.30                        | 635                | 375            |                            |               |
| 150      | 151     | 8 × 15      | 0.12    | 0.24                        | 595                | 415            | 10 × 12.5                  | 0.12          | 0.24                        | 680                | 435            |                            |               |
| 180      | 181     | 8 × 20      | 0.10    | 0.20                        | 730                | 520            | 10 × 15                    | 0.11          | 0.22                        | 700                | 500            |                            |               |
| 220      | 221     | 8 × 20      | 0.085   | 0.17                        | 795                | 580            | 10 × 15                    | 0.090         | 0.18                        | 825                | 560            |                            |               |
| 270      | 271     | 10 × 20     | 0.070   | 0.14                        | 985                | 735            | 12.5 × 15                  | 0.080         | 0.16                        | 920                | 690            |                            |               |
| 330      | 331     | 10 × 20     | 0.060   | 0.12                        | 1060               | 810            | 12.5 × 15                  | 0.065         | 0.13                        | 1020               | 780            |                            |               |
| 390      | 391     | 10 × 25     | 0.055   | 0.11                        | 1260               | 955            | 12.5 × 15                  | 0.060         | 0.12                        | 1060               | 825            |                            |               |
| 470      | 471     | 10 × 31.5   | 0.046   | 0.092                       | 1450               | 1130           | 16 × 15                    | 0.055         | 0.11                        | 1270               | 1010           |                            |               |
| 560      | 561     | 12.5 × 20   | 0.041   | 0.082                       | 1430               | 1160           | 16 × 15                    | 0.048         | 0.096                       | 1360               | 1100           |                            |               |
| 680      | 681     | 12.5 × 25   | 0.036   | 0.072                       | 1700               | 1370           | 18 × 15                    | 0.042         | 0.084                       | 1540               | 1270           |                            |               |
| 820      | 821     | 12.5 × 25   | 0.032   | 0.064                       | 1760               | 1490           | 18 × 15                    | 0.038         | 0.076                       | 1620               | 1370           |                            |               |
| 1000     | 102     | 12.5 × 31.5 | 0.029   | 0.058                       | 1980               | 1710           | 16 × 20                    | 0.034         | 0.068                       | 1770               | 1530           |                            |               |
| 1200     | 122     | 12.5 × 35.5 | 0.026   | 0.052                       | 2230               | 1920           | 16 × 25                    | 0.031         | 0.062                       | 2190               | 1740           |                            |               |
| 1500     | 152     | 12.5 × 40   | 0.024   | 0.048                       | 2460               | 2120           | 18 × 20                    | 0.028         | 0.056                       | 2050               | 1840           |                            |               |
| 1800     | 182     | 16 × 31.5   | 0.022   | 0.044                       | 2510               | 2220           | 18 × 25                    | 0.025         | 0.050                       | 2350               | 2060           |                            |               |
| 2200     | 222     | 16 × 35.5   | 0.020   | 0.040                       | 2770               | 2410           | 18 × 31.5                  | 0.023         | 0.046                       | 2720               | 2240           |                            |               |
| 2700     | 272     | 16 × 40     | 0.018   | 0.036                       | 3110               | 2610           | 18 × 35.5                  | 0.021         | 0.042                       | 3050               | 2420           |                            |               |
| 3300     | 332     | 18 × 40     | 0.017   | 0.034                       | 3300               | 2730           |                            |               |                             |                    |                |                            |               |

| Cap.(μF) | V(Code) | Size code   | Item  | 50 (1H)                     |                    |                |                            |               |                             |                    |                |                            |               |
|----------|---------|-------------|-------|-----------------------------|--------------------|----------------|----------------------------|---------------|-----------------------------|--------------------|----------------|----------------------------|---------------|
|          |         |             |       | —                           |                    |                |                            | 6             |                             |                    |                |                            |               |
|          |         |             |       | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)       |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)       |               |
|          |         |             |       |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |
| 0.47     | R47     | 5 × 11      | 23.0  | 46.0                        | 22                 | 11             |                            |               |                             |                    |                |                            |               |
| 0.68     | R68     | 5 × 11      | 16.0  | 32.0                        | 28                 | 14             |                            |               |                             |                    |                |                            |               |
| 1        | 010     | 5 × 11      | 11.0  | 22.0                        | 36                 | 18             |                            |               |                             |                    |                |                            |               |
| 1.5      | 1R5     | 5 × 11      | 7.50  | 15.0                        | 45                 | 22             |                            |               |                             |                    |                |                            |               |
| 2.2      | 2R2     | 5 × 11      | 5.00  | 10.0                        | 54                 | 27             |                            |               |                             |                    |                |                            |               |
| 3.3      | 3R3     | 5 × 11      | 3.30  | 6.60                        | 66                 | 33             |                            |               |                             |                    |                |                            |               |
| 4.7      | 4R7     | 5 × 11      | 2.20  | 4.40                        | 81                 | 40             |                            |               |                             |                    |                |                            |               |
| 6.8      | 6R8     | 5 × 11      | 1.80  | 3.60                        | 91                 | 45             |                            |               |                             |                    |                |                            |               |
| 10       | 100     | 5 × 11      | 1.40  | 2.80                        | 115                | 57             |                            |               |                             |                    |                |                            |               |
| 12       | 120     | 5 × 11      | 1.20  | 2.40                        | 125                | 62             |                            |               |                             |                    |                |                            |               |
| 15       | 150     | 5 × 11      | 0.93  | 1.86                        | 145                | 72             |                            |               |                             |                    |                |                            |               |
| 18       | 180     | 5 × 11      | 0.80  | 1.60                        | 165                | 79             |                            |               |                             |                    |                |                            |               |
| 22       | 220     | 6.3 × 11    | 0.65  | 1.30                        | 195                | 100            |                            |               |                             |                    |                |                            |               |
| 27       | 270     | 6.3 × 11    | 0.53  | 1.06                        | 215                | 115            |                            |               |                             |                    |                |                            |               |
| 33       | 330     | 6.3 × 11    | 0.43  | 0.86                        | 240                | 135            |                            |               |                             |                    |                |                            |               |
| 39       | 390     | 6.3 × 11    | 0.36  | 0.72                        | 260                | 150            |                            |               |                             |                    |                |                            |               |
| 47       | 470     | 6.3 × 15    | 0.30  | 0.60                        | 330                | 195            |                            |               |                             |                    |                |                            |               |
| 56       | 560     | 6.3 × 15    | 0.25  | 0.50                        | 360                | 220            |                            |               |                             |                    |                |                            |               |
| 68       | 680     | 8 × 11.5    | 0.20  | 0.40                        | 415                | 255            |                            |               |                             |                    |                |                            |               |
| 82       | 820     | 8 × 15      | 0.17  | 0.34                        | 505                | 320            | 10 × 12.5                  | 0.18          | 0.36                        | 530                | 330            |                            |               |
| 100      | 101     | 8 × 20      | 0.14  | 0.28                        | 620                | 410            | 10 × 15                    | 0.16          | 0.32                        | 580                | 385            |                            |               |
| 120      | 121     | 8 × 20      | 0.12  | 0.24                        | 755                | 455            | 10 × 15                    | 0.13          | 0.26                        | 755                | 435            |                            |               |
| 150      | 151     | 10 × 20     | 0.10  | 0.20                        | 820                | 570            | 12.5 × 15                  | 0.11          | 0.22                        | 785                | 545            |                            |               |
| 180      | 181     | 10 × 20     | 0.085 | 0.17                        | 945                | 635            | 12.5 × 15                  | 0.095         | 0.19                        | 845                | 605            |                            |               |
| 220      | 221     | 10 × 25     | 0.075 | 0.15                        | 1150               | 760            | 12.5 × 15                  | 0.080         | 0.16                        | 920                | 670            |                            |               |
| 270      | 271     | 10 × 31.5   | 0.065 | 0.13                        | 1200               | 900            | 16 × 15                    | 0.070         | 0.14                        | 1120               | 840            |                            |               |
| 330      | 331     | 10 × 31.5   | 0.055 | 0.11                        | 1300               | 995            | 16 × 15                    | 0.060         | 0.12                        | 1210               | 925            |                            |               |
| 390      | 391     | 12.5 × 25   | 0.048 | 0.096                       | 1440               | 1120           | 16 × 15                    | 0.055         | 0.11                        | 1270               | 990            |                            |               |
| 470      | 471     | 12.5 × 25   | 0.044 | 0.088                       | 1500               | 1190           | 18 × 15                    | 0.046         | 0.092                       | 1470               | 1170           |                            |               |
| 560      | 561     | 12.5 × 31.5 | 0.040 | 0.080                       | 1720               | 1360           | 16 × 20                    | 0.044         | 0.088                       | 1550               | 1260           |                            |               |
| 680      | 681     | 12.5 × 35.5 | 0.036 | 0.072                       | 1900               | 1530           | 16 × 20                    | 0.040         | 0.080                       | 1630               | 1350           |                            |               |
| 820      | 821     | 12.5 × 40   | 0.033 | 0.066                       | 2120               | 1700           | 18 × 20                    | 0.036         | 0.072                       | 1810               | 1530           |                            |               |
| 1000     | 102     | 16 × 31.5   | 0.030 | 0.060                       | 2150               | 1830           | 18 × 25                    | 0.033         | 0.066                       | 2020               | 1730           |                            |               |
| 1200     | 122     | 16 × 35.5   | 0.028 | 0.056                       | 2320               | 1990           | 18 × 31.5                  | 0.031         | 0.062                       | 2140               | 1880           |                            |               |
| 1500     | 152     | 16 × 40     | 0.026 | 0.052                       | 2650               | 2170           | 18 × 31.5                  | 0.029         | 0.058                       | 2340               | 1990           |                            |               |
| 1800     | 182     | 18 × 35.5   | 0.025 | 0.050                       | 2620               | 2210           |                            |               |                             |                    |                |                            |               |
| 2200     | 222     | 18 × 40     | 0.024 | 0.048                       | 2790               | 2300           |                            |               |                             |                    |                |                            |               |

※ In case of low profile type, [6] will be put at 12th digit of type numbering system.

## ■ Standard Ratings

| Cap.(μF) | Code | Item        | 63 (1J)                      |                    |                |                            |               |                              |                    |                |                            |               |
|----------|------|-------------|------------------------------|--------------------|----------------|----------------------------|---------------|------------------------------|--------------------|----------------|----------------------------|---------------|
|          |      |             | —                            |                    |                |                            | 6             |                              |                    |                |                            |               |
|          |      |             | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mA rms)      |               | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mA rms)      |               |
|          |      |             |                              | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |                              | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |
| 10       | 100  | 5 × 11      |                              | 1.06               | 2.12           | 135                        | 67            |                              |                    |                |                            |               |
| 12       | 120  | 5 × 11      |                              | 0.93               | 1.86           | 145                        | 72            |                              |                    |                |                            |               |
| 15       | 150  | 6.3 × 11    |                              | 0.73               | 1.46           | 185                        | 92            |                              |                    |                |                            |               |
| 18       | 180  | 6.3 × 11    |                              | 0.63               | 1.26           | 195                        | 100           |                              |                    |                |                            |               |
| 22       | 220  | 6.3 × 11    |                              | 0.52               | 1.04           | 215                        | 110           |                              |                    |                |                            |               |
| 27       | 270  | 6.3 × 11    |                              | 0.43               | 0.86           | 240                        | 130           |                              |                    |                |                            |               |
| 33       | 330  | 6.3 × 15    |                              | 0.35               | 0.70           | 305                        | 170           |                              |                    |                |                            |               |
| 39       | 390  | 6.3 × 15    |                              | 0.30               | 0.60           | 330                        | 190           |                              |                    |                |                            |               |
| 47       | 470  | 8 × 11.5    |                              | 0.25               | 0.50           | 365                        | 215           |                              |                    |                |                            |               |
| 56       | 560  | 8 × 15      |                              | 0.21               | 0.42           | 450                        | 275           | 10 × 12.5                    | 0.23               | 0.46           | 450                        | 275           |
| 68       | 680  | 8 × 15      |                              | 0.17               | 0.34           | 500                        | 315           | 10 × 12.5                    | 0.19               | 0.38           | 495                        | 310           |
| 82       | 820  | 8 × 20      |                              | 0.15               | 0.30           | 600                        | 385           | 10 × 15                      | 0.16               | 0.32           | 580                        | 375           |
| 100      | 101  | 10 × 20     |                              | 0.12               | 0.24           | 750                        | 495           | 12.5 × 15                    | 0.14               | 0.28           | 695                        | 460           |
| 120      | 121  | 10 × 20     |                              | 0.10               | 0.20           | 820                        | 555           | 12.5 × 15                    | 0.12               | 0.24           | 750                        | 510           |
| 150      | 151  | 10 × 25     |                              | 0.090              | 0.18           | 950                        | 665           | 12.5 × 15                    | 0.095              | 0.19           | 845                        | 590           |
| 180      | 181  | 10 × 31.5   |                              | 0.075              | 0.15           | 1110                       | 790           | 16 × 15                      | 0.080              | 0.16           | 1050                       | 750           |
| 220      | 221  | 12.5 × 20   |                              | 0.065              | 0.13           | 1140                       | 835           | 16 × 15                      | 0.070              | 0.14           | 1120                       | 820           |
| 270      | 271  | 12.5 × 25   |                              | 0.055              | 0.11           | 1340                       | 1000          | 18 × 15                      | 0.060              | 0.12           | 1290                       | 965           |
| 330      | 331  | 12.5 × 25   |                              | 0.049              | 0.098          | 1420                       | 1090          | 18 × 15                      | 0.050              | 0.10           | 1410                       | 1080          |
| 390      | 391  | 12.5 × 31.5 |                              | 0.043              | 0.086          | 1620                       | 1260          | 16 × 20                      | 0.047              | 0.094          | 1500                       | 1170          |
| 470      | 471  | 12.5 × 35.5 |                              | 0.039              | 0.078          | 1780                       | 1420          | 16 × 25                      | 0.042              | 0.084          | 1700                       | 1350          |
| 560      | 561  | 12.5 × 40   |                              | 0.035              | 0.070          | 1950                       | 1580          | 18 × 20                      | 0.039              | 0.078          | 1730                       | 1400          |
| 680      | 681  | 16 × 31.5   |                              | 0.032              | 0.064          | 2050                       | 1700          | 18 × 25                      | 0.035              | 0.070          | 1940                       | 1610          |
| 820      | 821  | 16 × 35.5   |                              | 0.029              | 0.058          | 2220                       | 1880          | 18 × 31.5                    | 0.032              | 0.064          | 2110                       | 1780          |
| 1000     | 102  | 16 × 40     |                              | 0.027              | 0.054          | 2370                       | 2050          | 18 × 35.5                    | 0.029              | 0.058          | 2280                       | 1970          |
| 1200     | 122  | 18 × 40     |                              | 0.025              | 0.050          | 2510                       | 2210          |                              |                    |                |                            |               |

| Cap.(μF) | Code | Item        | 80 (1K)                      |                    |                |                            |               |                              |                    |                |                            |               |
|----------|------|-------------|------------------------------|--------------------|----------------|----------------------------|---------------|------------------------------|--------------------|----------------|----------------------------|---------------|
|          |      |             | —                            |                    |                |                            | 6             |                              |                    |                |                            |               |
|          |      |             | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mA rms)      |               | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mA rms)      |               |
|          |      |             |                              | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |                              | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to<br>200kHz | 105°C / 120Hz |
| 4.7      | 4R7  | 5 × 11      |                              | 4.20               | 11.00          | 53                         | 26            |                              |                    |                |                            |               |
| 6.8      | 6R8  | 5 × 11      |                              | 2.60               | 7.00           | 68                         | 34            |                              |                    |                |                            |               |
| 10       | 100  | 6.3 × 11    |                              | 1.70               | 4.60           | 87                         | 43            |                              |                    |                |                            |               |
| 12       | 120  | 6.3 × 11    |                              | 1.40               | 3.80           | 96                         | 48            |                              |                    |                |                            |               |
| 15       | 150  | 6.3 × 11    |                              | 1.20               | 3.20           | 104                        | 52            |                              |                    |                |                            |               |
| 18       | 180  | 6.3 × 11    |                              | 1.00               | 2.70           | 150                        | 58            |                              |                    |                |                            |               |
| 22       | 220  | 6.3 × 15    |                              | 0.77               | 2.10           | 180                        | 71            |                              |                    |                |                            |               |
| 27       | 270  | 6.3 × 15    |                              | 0.63               | 1.70           | 220                        | 80            |                              |                    |                |                            |               |
| 33       | 330  | 8 × 11.5    |                              | 0.53               | 1.40           | 275                        | 132           |                              |                    |                |                            |               |
| 39       | 390  | 8 × 15      |                              | 0.46               | 1.20           | 300                        | 156           | 10 × 12.5                    | 0.49               | 1.30           | 380                        | 155           |
| 47       | 470  | 8 × 15      |                              | 0.39               | 1.10           | 360                        | 175           | 10 × 12.5                    | 0.42               | 1.10           | 410                        | 174           |
| 56       | 560  | 8 × 20      |                              | 0.34               | 0.92           | 490                        | 208           | 10 × 15                      | 0.36               | 0.97           | 500                        | 202           |
| 68       | 680  | 10 × 20     |                              | 0.28               | 0.76           | 570                        | 264           | 12.5 × 15                    | 0.31               | 0.84           | 520                        | 249           |
| 82       | 820  | 10 × 20     |                              | 0.25               | 0.68           | 620                        | 284           | 12.5 × 15                    | 0.27               | 0.73           | 560                        | 273           |
| 100      | 101  | 10 × 25     |                              | 0.21               | 0.57           | 795                        | 347           | 12.5 × 15                    | 0.23               | 0.62           | 605                        | 308           |
| 120      | 121  | 10 × 31.5   |                              | 0.18               | 0.49           | 870                        | 406           | 16 × 15                      | 0.20               | 0.54           | 663                        | 444           |
| 150      | 151  | 10 × 31.5   |                              | 0.15               | 0.41           | 955                        | 459           | 16 × 15                      | 0.18               | 0.47           | 699                        | 484           |
| 180      | 181  | 12.5 × 25   |                              | 0.13               | 0.35           | 1040                       | 520           | 16 × 15                      | 0.15               | 0.41           | 766                        | 543           |
| 220      | 221  | 12.5 × 31.5 |                              | 0.12               | 0.32           | 1160                       | 595           | 18 × 15                      | 0.13               | 0.35           | 881                        | 643           |
| 270      | 271  | 12.5 × 31.5 |                              | 0.10               | 0.27           | 1270                       | 667           | 16 × 20                      | 0.11               | 0.30           | 1240                       | 742           |
| 330      | 331  | 12.5 × 35.5 |                              | 0.088              | 0.24           | 1450                       | 767           | 16 × 25                      | 0.099              | 0.27           | 1440                       | 874           |
| 390      | 391  | 12.5 × 40   |                              | 0.078              | 0.21           | 1610                       | 822           | 18 × 20                      | 0.089              | 0.24           | 1450                       | 908           |
| 470      | 471  | 16 × 31.5   |                              | 0.069              | 0.19           | 1790                       | 1150          | 18 × 25                      | 0.080              | 0.22           | 1650                       | 1060          |
| 560      | 561  | 16 × 35.5   |                              | 0.062              | 0.17           | 2000                       | 1300          | 18 × 31.5                    | 0.072              | 0.19           | 1750                       | 1210          |
| 680      | 681  | 16 × 40     |                              | 0.055              | 0.15           | 2200                       | 1470          | 18 × 31.5                    | 0.065              | 0.18           | 1850                       | 1300          |
| 820      | 821  | 18 × 35.5   |                              | 0.049              | 0.13           | 2250                       | 1590          |                              |                    |                |                            |               |
| 1000     | 102  | 18 × 40     |                              | 0.044              | 0.12           | 2370                       | 1790          |                              |                    |                |                            |               |

※ In case of low profile type, [6] will be put at 12th digit of type numbering system.

## ■ Standard Ratings

| Cap.(μF) | V(Code) | Size code | Item        | 100 (2A)                    |                    |                |                         |               |                             |                    |                |                         |               |
|----------|---------|-----------|-------------|-----------------------------|--------------------|----------------|-------------------------|---------------|-----------------------------|--------------------|----------------|-------------------------|---------------|
|          |         |           |             | —                           |                    |                |                         | 6             |                             |                    |                |                         |               |
|          |         |           |             | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)    |               | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple (mArms)    |               |
|          |         |           |             |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to 200kHz | 105°C / 120Hz |                             | 20°C / 100kHz      | −10°C / 100kHz | 105°C / 10kHz to 200kHz | 105°C / 120Hz |
| 0.47     | R47     |           | 5 × 11      |                             | 43.0               | 116.0          | 17                      | 8             |                             |                    |                |                         |               |
| 0.68     | R68     |           | 5 × 11      |                             | 23.0               | 62.0           | 23                      | 11            |                             |                    |                |                         |               |
| 1        | 010     |           | 5 × 11      |                             | 17.0               | 46.0           | 27                      | 13            |                             |                    |                |                         |               |
| 1.5      | 1R5     |           | 5 × 11      |                             | 10.0               | 27.0           | 35                      | 17            |                             |                    |                |                         |               |
| 2.2      | 2R2     |           | 5 × 11      |                             | 6.60               | 18.0           | 43                      | 21            |                             |                    |                |                         |               |
| 3.3      | 3R3     |           | 5 × 11      |                             | 4.10               | 11.0           | 54                      | 27            |                             |                    |                |                         |               |
| 4.7      | 4R7     |           | 6.3 × 11    |                             | 2.80               | 7.60           | 68                      | 34            |                             |                    |                |                         |               |
| 6.8      | 6R8     |           | 6.3 × 11    |                             | 1.90               | 5.10           | 83                      | 41            |                             |                    |                |                         |               |
| 10       | 100     |           | 6.3 × 11    |                             | 1.20               | 3.20           | 104                     | 52            |                             |                    |                |                         |               |
| 12       | 120     |           | 6.3 × 11    |                             | 1.00               | 2.70           | 150                     | 57            |                             |                    |                |                         |               |
| 15       | 150     |           | 6.3 × 15    |                             | 0.81               | 2.20           | 180                     | 65            |                             |                    |                |                         |               |
| 18       | 180     |           | 6.3 × 15    |                             | 0.67               | 1.80           | 220                     | 73            |                             |                    |                |                         |               |
| 22       | 220     |           | 8 × 11.5    |                             | 0.55               | 1.50           | 275                     | 122           |                             |                    |                |                         |               |
| 27       | 270     |           | 8 × 15      |                             | 0.47               | 1.30           | 300                     | 146           | 10 × 12.5                   | 0.50               | 1.40           | 380                     | 145           |
| 33       | 330     |           | 8 × 15      |                             | 0.38               | 1.00           | 360                     | 169           | 10 × 12.5                   | 0.42               | 1.10           | 410                     | 166           |
| 39       | 390     |           | 8 × 20      |                             | 0.33               | 0.89           | 490                     | 202           | 10 × 15                     | 0.36               | 0.97           | 500                     | 193           |
| 47       | 470     |           | 10 × 20     |                             | 0.28               | 0.76           | 570                     | 252           | 12.5 × 15                   | 0.31               | 0.84           | 520                     | 239           |
| 56       | 560     |           | 10 × 20     |                             | 0.24               | 0.65           | 620                     | 274           | 12.5 × 15                   | 0.27               | 0.73           | 560                     | 258           |
| 68       | 680     |           | 10 × 25     |                             | 0.21               | 0.57           | 795                     | 326           | 12.5 × 15                   | 0.23               | 0.62           | 605                     | 289           |
| 82       | 820     |           | 10 × 31.5   |                             | 0.18               | 0.49           | 870                     | 386           | 16 × 15                     | 0.19               | 0.51           | 681                     | 433           |
| 100      | 101     |           | 10 × 31.5   |                             | 0.15               | 0.41           | 955                     | 438           | 16 × 15                     | 0.17               | 0.46           | 719                     | 475           |
| 120      | 121     |           | 12.5 × 25   |                             | 0.13               | 0.35           | 1040                    | 519           | 16 × 15                     | 0.14               | 0.38           | 793                     | 531           |
| 150      | 151     |           | 12.5 × 25   |                             | 0.11               | 0.30           | 1120                    | 553           | 18 × 15                     | 0.12               | 0.32           | 917                     | 635           |
| 180      | 181     |           | 12.5 × 31.5 |                             | 0.098              | 0.26           | 1270                    | 641           | 16 × 20                     | 0.11               | 0.30           | 1240                    | 706           |
| 220      | 221     |           | 12.5 × 35.5 |                             | 0.087              | 0.23           | 1450                    | 730           | 16 × 25                     | 0.093              | 0.25           | 1440                    | 854           |
| 270      | 271     |           | 12.5 × 40   |                             | 0.072              | 0.19           | 1610                    | 843           | 18 × 20                     | 0.080              | 0.22           | 1450                    | 918           |
| 330      | 331     |           | 16 × 31.5   |                             | 0.062              | 0.17           | 1790                    | 1160          | 18 × 25                     | 0.070              | 0.19           | 1650                    | 1080          |
| 390      | 391     |           | 16 × 35.5   |                             | 0.053              | 0.14           | 2000                    | 1340          | 18 × 31.5                   | 0.062              | 0.17           | 1850                    | 1240          |
| 470      | 471     |           | 16 × 40     |                             | 0.047              | 0.13           | 2200                    | 1530          | 18 × 35.5                   | 0.056              | 0.15           | 1970                    | 1410          |
| 560      | 561     |           | 18 × 35.5   |                             | 0.041              | 0.11           | 2250                    | 1680          |                             |                    |                |                         |               |
| 680      | 681     |           | 18 × 40     |                             | 0.036              | 0.097          | 2300                    | 1910          |                             |                    |                |                         |               |

※ In case of low profile type, [6] will be put at 12th digit of type numbering system.

| Cap.(μF) | V(Code) | Code | 160       |     | 200       |     | 250       |     | 315       |     | 350       |     | 400       |     | 450                      |     |
|----------|---------|------|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|--------------------------|-----|
|          |         |      | 2C        |     | 2D        |     | 2E        |     | 2F        |     | 2V        |     | 2G        |     | 2W                       |     |
| 1        | 010     |      | 8 × 11.5  | 19  | 8 × 11.5  | 19  | 8 × 11.5  | 19  | 8 × 11.5  | 19  | 10 × 12.5 | 21  | 10 × 12.5 | 17  | 10 × 15                  | 17  |
| 2.2      | 2R2     |      | 8 × 11.5  | 30  | 8 × 11.5  | 30  | 10 × 12.5 | 32  | 10 × 12.5 | 32  | 10 × 15   | 34  | 10 × 15   | 28  | 10 × 20                  | 28  |
| 3.3      | 3R3     |      | 10 × 12.5 | 50  | 10 × 12.5 | 50  | 10 × 15   | 52  | 10 × 15   | 52  | 10 × 20   | 54  | 10 × 20   | 47  | 12.5 × 20                | 48  |
| 4.7      | 4R7     |      | 10 × 12.5 | 57  | 10 × 15   | 60  | 10 × 15   | 60  | 10 × 20   | 65  | 10 × 20   | 65  | 12.5 × 20 | 55  | 12.5 × 25                | 55  |
| 10       | 100     |      | 10 × 15   | 90  | 10 × 20   | 95  | 12.5 × 20 | 98  | 12.5 × 20 | 98  | 12.5 × 25 | 100 | 12.5 × 25 | 85  | 16 × 25                  | 90  |
| 22       | 220     |      | 12.5 × 20 | 140 | 12.5 × 25 | 145 | 16 × 25   | 150 | 16 × 25   | 150 | 16 × 25   | 150 | 16 × 31.5 | 130 | 16 × 35.5                | 135 |
| 33       | 330     |      | 12.5 × 25 | 175 | 16 × 25   | 180 | 16 × 25   | 180 | 16 × 31.5 | 185 | 16 × 35.5 | 190 | 18 × 35.5 | 170 | 18 × 40                  | 170 |
| 47       | 470     |      | 16 × 25   | 220 | 16 × 25   | 220 | 16 × 31.5 | 225 | 18 × 35.5 | 235 | 18 × 40   | 240 |           |     | Case size<br>φD × L (mm) | ※   |
| 100      | 101     |      | 16 × 35.5 | 330 | 18 × 40   | 345 | 18 × 40   | 345 |           |     |           |     |           |     |                          |     |

※ Rated ripple current (mArms) at 105°C 120Hz