

# KKM Series

Radial Aluminium Electrolytic Capacitors

## Features

- 2000 ~ 3000 hours at 105°C
- Solvent-resistant type, except 315 ~ 450 V
- RoHS compliant



**TEMPERATURE RANGE**  
-40 / -25°C ... +105°C

**RATED VOLTAGE**  
6.3 – 450 V

**CAPACITANCE**  
0.1 – 22000  $\mu$ F

**ENDURANCE**  
105°C 2000 – 3000 h

Temperature range: -40°C ... +105°C for 6.3 ~ 100 V; -25°C ... +105°C for 160 ~ 450 V. Endurance: 2000 h for  $\Phi D \leq 8$ ; 3000 h for  $\Phi D > 8$ .

## Specifications

|                             |                                                                                                                                                                                                                                                                                     |                                                                                                |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Operating temperature range | 6.3 ~ 100 V: -40 ~ +105°C<br>160 ~ 450 V: -25 ~ +105°C                                                                                                                                                                                                                              |                                                                                                |
| Rated voltage range         | 6.3 ~ 450 V                                                                                                                                                                                                                                                                         |                                                                                                |
| Capacitance range           | 0.1 ~ 22000 μF                                                                                                                                                                                                                                                                      |                                                                                                |
| Capacitance tolerance       | ±20% (20°C, 120 Hz)                                                                                                                                                                                                                                                                 |                                                                                                |
| Leakage current             | 6.3 ~ 100 V: After 2 minutes' application of rated voltage at 20°C, not more than 0.02CV or 4 μA, whichever is greater<br>160 ~ 450 V: After 5 minutes' application of rated voltage at 20°C, not more than 0.02CV + 15 μA                                                          |                                                                                                |
| Load life                   | The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage with the rated ripple current has been applied for 2000 ~ 3000 hours.                                                                                                     |                                                                                                |
|                             | Capacitance change                                                                                                                                                                                                                                                                  | Within ±20% of the initial value                                                               |
|                             | D.F. (tan δ)                                                                                                                                                                                                                                                                        | Not more than 200% of the specified value                                                      |
|                             | Leakage current                                                                                                                                                                                                                                                                     | Not more than the specified value                                                              |
|                             | Life by case diameter                                                                                                                                                                                                                                                               | ΦD ≤ 8: 2000 hours<br>ΦD > 8: 3000 hours                                                       |
| Shelf life                  | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposure for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitors shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                                |
|                             | Capacitance change                                                                                                                                                                                                                                                                  | 6.3 ~ 100 V: Within ±25% of the initial value<br>160 ~ 450 V: Within ±20% of the initial value |
|                             | D.F. (tan δ)                                                                                                                                                                                                                                                                        | Not more than 200% of the specified value                                                      |
|                             | Leakage current                                                                                                                                                                                                                                                                     | Not more than 200% of the specified value                                                      |

## Low-temperature characteristics

| Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 ~ 250 | 350 ~ 400 | 450 |
|-------------------|-----|----|----|----|----|----|----|-----|-----------|-----------|-----|
| Z(-25°C)/Z(+20°C) | 5   | 4  | 3  | 2  | 2  | 2  | 2  | 2   | 3         | 6         | 6   |
| Z(-40°C)/Z(+20°C) | 12  | 10 | 8  | 5  | 4  | 3  | 3  | 3   | 4         | 6         | —   |

Impedance ratio at 120 Hz. Z(-40°C)/Z(+20°C) is not specified for 450 V.

## Ripple current frequency correction factor

| Frequency                | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10 kHz | 100 kHz |
|--------------------------|-------|--------|--------|-------|--------|---------|
| 0.1 ~ 4.7 $\mu\text{F}$  | 0.65  | 1.00   | 1.35   | 1.75  | 2.30   | 2.50    |
| 10 ~ 47 $\mu\text{F}$    | 0.75  | 1.00   | 1.25   | 1.50  | 1.75   | 1.80    |
| 100 ~ 1000 $\mu\text{F}$ | 0.80  | 1.00   | 1.15   | 1.30  | 1.40   | 1.50    |
| $\geq 2200 \mu\text{F}$  | 0.85  | 1.00   | 1.03   | 1.05  | 1.08   | 1.08    |

## Dissipation factor ( $\tan \delta$ ) at 20°C, 120 Hz

| Rated voltage (V)    | 6.3  | 10   | 16   | 25   | 35   | 50   | 63   | 100  | 160 ~ 250 | 350 ~ 400 | 450  |
|----------------------|------|------|------|------|------|------|------|------|-----------|-----------|------|
| $\tan \delta$ (max.) | 0.34 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.20      | 0.24      | 0.24 |

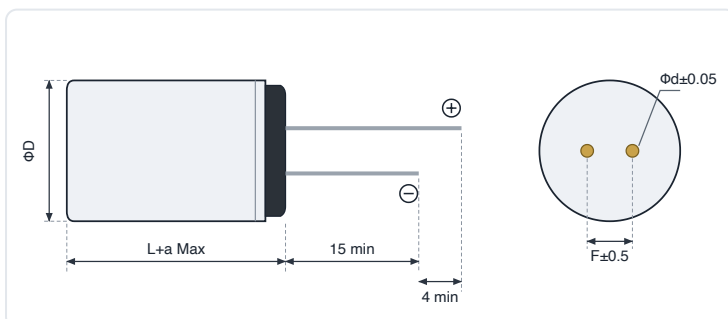
For capacitance above 1000  $\mu\text{F}$ , add 0.02 for every additional 1000  $\mu\text{F}$ .

## Standard ratings

| $\mu\text{F} \setminus \text{V}$ | 6.3     | 10      | 16      | 25      | 35      | 50      | 63      | 100     | 160     | 200     | 250     | 350     | 400     | 450     |
|----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0.1                              |         |         |         |         |         | 5×11    |         | 5×11    |         |         |         |         |         |         |
| 0.22                             |         |         |         |         |         | 5×11    |         | 5×11    |         |         |         |         |         |         |
| 0.33                             |         |         |         |         |         | 5×11    |         | 5×11    |         |         |         |         |         |         |
| 0.47                             |         |         |         |         |         | 5×11    |         | 5×11    |         |         |         | 6.3×12  |         |         |
| 1                                |         |         |         |         |         | 5×11    |         | 5×11    |         |         |         | 6.3×12  | 6.3×12  |         |
| 2.2                              |         |         |         |         |         | 5×11    |         | 5×11    |         |         | 6.3×12  | 8×12    | 8×12    | 10×12.5 |
| 3.3                              |         |         |         |         |         | 5×11    |         | 5×11    | 6.3×12  | 6.3×12  | 8×12    | 10×12.5 | 10×12.5 | 10×16   |
| 4.7                              |         |         |         | 5×11    | 5×11    | 5×11    |         | 5×11    | 6.3×12  | 8×12    | 8×12    | 10×16   | 10×16   | 10×20   |
| 10                               |         |         | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 6.3×12  | 10×12.5 | 10×16   | 10×16   | 10×20   | 10×20   | 13×20   |
| 22                               |         | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 8×12    | 10×20   | 10×20   | 13×20   | 13×20   | 13×25   | 16×25   |
| 33                               | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 6.3×12  | 8×12    | 10×20   | 13×20   | 13×20   | 16×25   | 16×25   | 16×31.5 |
| 47                               | 5×11    | 5×11    | 5×11    | 5×11    | 5×11    | 6.3×12  | 6.3×12  | 10×12.5 | 13×20   | 13×20   | 13×25   | 16×25   | 16×31.5 | 16×35.5 |
| 68                               |         |         |         |         |         |         |         |         |         |         |         |         |         | 18×36   |
| 100                              | 5×11    | 5×11    | 5×11    | 6.3×12  | 6.3×12  | 8×12    | 10×12.5 | 10×20   | 16×25   | 16×25   | 16×31.5 | 18×31.5 | 16×40   |         |
| 120                              |         |         |         |         |         |         |         |         |         |         |         |         | 18×40   |         |
| 220                              | 5×11    | 6.3×12  | 6.3×12  | 8×12    | 8×12    | 10×12.5 | 10×16   | 13×25   | 16×31.5 | 18×35.5 | 18×40   |         |         |         |
| 330                              | 6.3×12  | 6.3×12  | 8×12    | 8×12    | 10×12.5 | 10×16   | 10×20   | 16×25   | 18×35.5 |         |         |         |         |         |
| 470                              | 6.3×12  | 8×12    | 8×12    | 10×12.5 | 10×16   | 10×20   | 13×20   | 16×31.5 |         |         |         |         |         |         |
| 1000                             | 8×12    | 10×12.5 | 10×16   | 10×20   | 13×20   | 13×25   | 16×25   | 18×40   |         |         |         |         |         |         |
| 2200                             | 10×20   | 10×20   | 13×20   | 13×25   | 16×25   | 16×35.5 |         |         |         |         |         |         |         |         |
| 3300                             | 10×20   | 13×20   | 13×25   | 16×25   | 16×35.5 | 18×35.5 |         |         |         |         |         |         |         |         |
| 4700                             | 13×20   | 13×25   | 16×25   | 16×31.5 | 18×35.5 |         |         |         |         |         |         |         |         |         |
| 6800                             | 13×25   | 16×25   | 16×31.5 | 18×35.5 |         |         |         |         |         |         |         |         |         |         |
| 10000                            | 16×25   | 16×35.5 | 18×35.5 |         |         |         |         |         |         |         |         |         |         |         |
| 15000                            | 16×35.5 | 18×35.5 |         |         |         |         |         |         |         |         |         |         |         |         |
| 22000                            | 18×40   |         |         |         |         |         |         |         |         |         |         |         |         |         |

Case size  $\Phi\text{D} \times \text{L}$  (mm). Full ratings in the characteristics list.

## Dimensions



| $\Phi\text{D}$ | 5   | 6.3 | 8   | 10  | 13  | 16  | 18  |
|----------------|-----|-----|-----|-----|-----|-----|-----|
| F              | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| $\Phi\text{d}$ | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.8 | 0.8 |
| a              | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 2.0 |

The original drawing also marks:  $\Phi\text{D} + 0.5$  max ( $\Phi\text{D} \geq 22$ : + 1.0 max); vent ( $\Phi \geq 8$ ); sleeve.

Unit: mm

## How to order

|                           |                                                                                                                           |                                                                                                         |                                                                      |                                                                                                                             |                                                   |                          |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------|
| <b>KKM</b><br>Series code | <b>4</b><br>Number of characters for capacitance<br>$47\mu\text{F} = 2$ , $470\mu\text{F} = 3$ ,<br>$4700\mu\text{F} = 4$ | <b>102</b><br>Capacitance<br>$47\mu\text{F} = 470$ , $3300\mu\text{F} = 332$ , $33000\mu\text{F} = 333$ | <b>M</b><br>Capacitance tolerance<br>$M = \pm 20\%$ , $K = \pm 10\%$ | <b>100</b><br>Voltage code<br>$6.3\text{V} = 6\text{R}3$ , $10\text{V} = 100$ , $63\text{V} = 630$ ,<br>$100\text{V} = 101$ | <b>B</b><br>Package<br>B: bulk pack, A: ammo pack | <b>8X12</b><br>Size code |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------|

Example: KKM4102M100B8X12

## Characteristics list

| Rated voltage (V) | Capacitance ( $\mu\text{F}$ ) | Rated ripple current (mA rms, 105°C, 120 Hz) | Case size $\Phi\text{D} \times \text{L}$ (mm) | Surge voltage (V) |
|-------------------|-------------------------------|----------------------------------------------|-----------------------------------------------|-------------------|
| 6.3               | 33                            | 54                                           | 5x11                                          | 8                 |
| 6.3               | 47                            | 64                                           | 5x11                                          | 8                 |
| 6.3               | 100                           | 94                                           | 5x11                                          | 8                 |
| 6.3               | 220                           | 140                                          | 5x11                                          | 8                 |
| 6.3               | 330                           | 190                                          | 6.3x12                                        | 8                 |
| 6.3               | 470                           | 230                                          | 6.3x12                                        | 8                 |
| 6.3               | 1000                          | 380                                          | 8x12                                          | 8                 |
| 6.3               | 2200                          | 710                                          | 10x20                                         | 8                 |
| 6.3               | 3300                          | 840                                          | 10x20                                         | 8                 |
| 6.3               | 4700                          | 1090                                         | 13x20                                         | 8                 |
| 6.3               | 6800                          | 1350                                         | 13x25                                         | 8                 |
| 6.3               | 10000                         | 1650                                         | 16x25                                         | 8                 |
| 6.3               | 15000                         | 2010                                         | 16x35.5                                       | 8                 |
| 6.3               | 22000                         | 2350                                         | 18x40                                         | 8                 |
| 10                | 22                            | 46                                           | 5x11                                          | 13                |
| 10                | 33                            | 57                                           | 5x11                                          | 13                |
| 10                | 47                            | 68                                           | 5x11                                          | 13                |
| 10                | 100                           | 100                                          | 5x11                                          | 13                |
| 10                | 220                           | 170                                          | 6.3x12                                        | 13                |
| 10                | 330                           | 200                                          | 6.3x12                                        | 13                |
| 10                | 470                           | 250                                          | 8x12                                          | 13                |
| 10                | 1000                          | 460                                          | 10x12.5                                       | 13                |
| 10                | 2200                          | 760                                          | 10x20                                         | 13                |
| 10                | 3300                          | 1000                                         | 13x20                                         | 13                |
| 10                | 4700                          | 1260                                         | 13x25                                         | 13                |
| 10                | 6800                          | 1570                                         | 16x25                                         | 13                |
| 10                | 10000                         | 1890                                         | 16x35.5                                       | 13                |
| 10                | 15000                         | 2180                                         | 18x35.5                                       | 13                |
| 16                | 10                            | 34                                           | 5x11                                          | 20                |
| 16                | 22                            | 51                                           | 5x11                                          | 20                |
| 16                | 33                            | 63                                           | 5x11                                          | 20                |
| 16                | 47                            | 75                                           | 5x11                                          | 20                |
| 16                | 100                           | 110                                          | 5x11                                          | 20                |
| 16                | 220                           | 180                                          | 6.3x12                                        | 20                |
| 16                | 330                           | 260                                          | 8x12                                          | 20                |
| 16                | 470                           | 310                                          | 8x12                                          | 20                |
| 16                | 1000                          | 560                                          | 10x16                                         | 20                |
| 16                | 2200                          | 920                                          | 13x20                                         | 20                |
| 16                | 3300                          | 1170                                         | 13x25                                         | 20                |
| 16                | 4700                          | 1480                                         | 16x25                                         | 20                |
| 16                | 6800                          | 1780                                         | 16x31.5                                       | 20                |
| 16                | 10000                         | 2060                                         | 18x35.5                                       | 20                |
| 25                | 4.7                           | 25                                           | 5x11                                          | 32                |
| 25                | 10                            | 36                                           | 5x11                                          | 32                |
| 25                | 22                            | 54                                           | 5x11                                          | 32                |
| 25                | 33                            | 67                                           | 5x11                                          | 32                |
| 25                | 47                            | 80                                           | 5x11                                          | 32                |
| 25                | 100                           | 130                                          | 6.3x12                                        | 32                |
| 25                | 220                           | 230                                          | 8x12                                          | 32                |
| 25                | 330                           | 310                                          | 8x12                                          | 32                |
| 25                | 470                           | 380                                          | 10x12.5                                       | 32                |
| 25                | 1000                          | 680                                          | 10x20                                         | 32                |
| 25                | 2200                          | 1090                                         | 13x25                                         | 32                |
| 25                | 3300                          | 1400                                         | 16x25                                         | 32                |
| 25                | 4700                          | 1710                                         | 16x31.5                                       | 32                |
| 25                | 6800                          | 2040                                         | 18x35.5                                       | 32                |
| 35                | 4.7                           | 28                                           | 5x11                                          | 44                |

| Rated voltage (V) | Capacitance (μF) | Rated ripple current (mA rms, 105°C, 120 Hz) | Case size ΦD×L (mm) | Surge voltage (V) |
|-------------------|------------------|----------------------------------------------|---------------------|-------------------|
| 35                | 10               | 41                                           | 5×11                | 44                |
| 35                | 22               | 61                                           | 5×11                | 44                |
| 35                | 33               | 75                                           | 5×11                | 44                |
| 35                | 47               | 90                                           | 5×11                | 44                |
| 35                | 100              | 150                                          | 6.3×12              | 44                |
| 35                | 220              | 270                                          | 8×12                | 44                |
| 35                | 330              | 350                                          | 10×12.5             | 44                |
| 35                | 470              | 460                                          | 10×16               | 44                |
| 35                | 1000             | 810                                          | 13×20               | 44                |
| 35                | 2200             | 1260                                         | 16×25               | 44                |
| 35                | 3300             | 1610                                         | 16×35.5             | 44                |
| 35                | 4700             | 1910                                         | 18×35.5             | 44                |
| 50                | 0.1              | 1.3                                          | 5×11                | 63                |
| 50                | 0.22             | 2.9                                          | 5×11                | 63                |
| 50                | 0.33             | 4.3                                          | 5×11                | 63                |
| 50                | 0.47             | 6.2                                          | 5×11                | 63                |
| 50                | 1                | 13                                           | 5×11                | 63                |
| 50                | 2.2              | 20                                           | 5×11                | 63                |
| 50                | 3.3              | 25                                           | 5×11                | 63                |
| 50                | 4.7              | 30                                           | 5×11                | 63                |
| 50                | 10               | 40                                           | 5×11                | 63                |
| 50                | 22               | 65                                           | 5×11                | 63                |
| 50                | 33               | 90                                           | 5×11                | 63                |
| 50                | 47               | 110                                          | 6.3×12              | 63                |
| 50                | 100              | 180                                          | 8×12                | 63                |
| 50                | 220              | 300                                          | 10×12.5             | 63                |
| 50                | 330              | 410                                          | 10×16               | 63                |
| 50                | 470              | 530                                          | 10×20               | 63                |
| 50                | 1000             | 950                                          | 13×25               | 63                |
| 50                | 2200             | 1470                                         | 16×35.5             | 63                |
| 50                | 3300             | 1770                                         | 18×35.5             | 63                |
| 63                | 10               | 46                                           | 5×11                | 79                |
| 63                | 22               | 71                                           | 5×11                | 79                |
| 63                | 33               | 100                                          | 6.3×12              | 79                |
| 63                | 47               | 120                                          | 6.3×12              | 79                |
| 63                | 100              | 215                                          | 10×12.5             | 79                |
| 63                | 220              | 335                                          | 10×16               | 79                |
| 63                | 330              | 510                                          | 10×20               | 79                |
| 63                | 470              | 640                                          | 13×20               | 79                |
| 63                | 1000             | 930                                          | 16×25               | 79                |
| 100               | 0.1              | 1.5                                          | 5×11                | 125               |
| 100               | 0.22             | 3.4                                          | 5×11                | 125               |
| 100               | 0.33             | 5.0                                          | 5×11                | 125               |
| 100               | 0.47             | 7.1                                          | 5×11                | 125               |
| 100               | 1                | 15                                           | 5×11                | 125               |
| 100               | 2.2              | 21                                           | 5×11                | 125               |
| 100               | 3.3              | 29                                           | 5×11                | 125               |
| 100               | 4.7              | 32                                           | 5×11                | 125               |
| 100               | 10               | 54                                           | 6.3×12              | 125               |
| 100               | 22               | 93                                           | 8×12                | 125               |
| 100               | 33               | 130                                          | 8×12                | 125               |
| 100               | 47               | 165                                          | 10×12.5             | 125               |
| 100               | 100              | 265                                          | 10×20               | 125               |
| 100               | 220              | 440                                          | 13×25               | 125               |
| 100               | 330              | 540                                          | 16×25               | 125               |
| 100               | 470              | 715                                          | 16×31.5             | 125               |
| 100               | 1000             | 985                                          | 18×40               | 125               |
| 160               | 3.3              | 28                                           | 6.3×12              | 200               |
| 160               | 4.7              | 34                                           | 6.3×12              | 200               |
| 160               | 10               | 67                                           | 10×12.5             | 200               |
| 160               | 22               | 120                                          | 10×20               | 200               |
| 160               | 33               | 145                                          | 10×20               | 200               |
| 160               | 47               | 195                                          | 13×20               | 200               |
| 160               | 100              | 335                                          | 16×25               | 200               |
| 160               | 220              | 540                                          | 16×31.5             | 200               |
| 160               | 330              | 705                                          | 18×35.5             | 200               |
| 200               | 3.3              | 28                                           | 6.3×12              | 250               |
| 200               | 4.7              | 39                                           | 8×12                | 250               |
| 200               | 10               | 74                                           | 10×16               | 250               |

| Rated voltage (V) | Capacitance (μF) | Rated ripple current (mA rms, 105°C, 120 Hz) | Case size ΦD×L (mm) | Surge voltage (V) |
|-------------------|------------------|----------------------------------------------|---------------------|-------------------|
| 200               | 22               | 120                                          | 10×20               | 250               |
| 200               | 33               | 160                                          | 13×20               | 250               |
| 200               | 47               | 195                                          | 13×20               | 250               |
| 200               | 100              | 335                                          | 16×25               | 250               |
| 200               | 220              | 575                                          | 18×35.5             | 250               |
| 250               | 2.2              | 23                                           | 6.3×12              | 300               |
| 250               | 3.3              | 32                                           | 8×12                | 300               |
| 250               | 4.7              | 39                                           | 8×12                | 300               |
| 250               | 10               | 74                                           | 10×16               | 300               |
| 250               | 22               | 130                                          | 13×20               | 300               |
| 250               | 33               | 160                                          | 13×20               | 300               |
| 250               | 47               | 210                                          | 13×25               | 300               |
| 250               | 100              | 365                                          | 16×31.5             | 300               |
| 250               | 220              | 585                                          | 18×40               | 300               |
| 350               | 0.47             | 11                                           | 6.3×12              | 400               |
| 350               | 1                | 15                                           | 6.3×12              | 400               |
| 350               | 2.2              | 26                                           | 8×12                | 400               |
| 350               | 3.3              | 38                                           | 10×12.5             | 400               |
| 350               | 4.7              | 50                                           | 10×16               | 400               |
| 350               | 10               | 80                                           | 10×20               | 400               |
| 350               | 22               | 130                                          | 13×20               | 400               |
| 350               | 33               | 195                                          | 16×25               | 400               |
| 350               | 47               | 230                                          | 16×25               | 400               |
| 350               | 100              | 375                                          | 18×31.5             | 400               |
| 400               | 1                | 15                                           | 6.3×12              | 450               |
| 400               | 2.2              | 26                                           | 8×12                | 450               |
| 400               | 3.3              | 38                                           | 10×12.5             | 450               |
| 400               | 4.7              | 50                                           | 10×16               | 450               |
| 400               | 10               | 80                                           | 10×20               | 450               |
| 400               | 22               | 145                                          | 13×25               | 450               |
| 400               | 33               | 195                                          | 16×25               | 450               |
| 400               | 47               | 250                                          | 16×31.5             | 450               |
| 400               | 100              | 350                                          | 16×40               | 450               |
| 400               | 120              | 550                                          | 18×40               | 450               |
| 450               | 2.2              | 23                                           | 10×12.5             | 500               |
| 450               | 3.3              | 31                                           | 10×16               | 500               |
| 450               | 4.7              | 40                                           | 10×20               | 500               |
| 450               | 10               | 65                                           | 13×20               | 500               |
| 450               | 22               | 115                                          | 16×25               | 500               |
| 450               | 33               | 155                                          | 16×31.5             | 500               |
| 450               | 47               | 185                                          | 16×35.5             | 500               |
| 450               | 68               | 205                                          | 18×36               | 500               |

The ordering example KKM 4 102 M 100 B 8X12 (1000 μF, 10 V) uses size code 8X12, while the ratings table gives 10×12.5 for 10 V / 1000 μF — subject to manufacturer confirmation.

Z(−40°C)/Z(+20°C) values are given for 160 ~ 400 V, although the operating temperature range for 160 ~ 450 V starts at −25°C — subject to manufacturer confirmation.

Frequency correction table: the original sheet labels the rows 'Rated Voltage (μF)'; the row values are read as capacitance ranges in μF — subject to manufacturer confirmation.

450 V / 68 μF lies between the 10 ~ 47 μF and 100 ~ 1000 μF rows of the frequency correction table; no factor is given for it — subject to manufacturer confirmation.

450 V / 68 μF: the case size is printed as 18×36; all other cases of this length are printed as ×35.5 — subject to manufacturer confirmation.

Solvent resistance: the original sheet prints 'except 315to450' with no unit; read as 315 ~ 450 V (the ratings table has no 315 V rating) — subject to manufacturer confirmation.