

# KZM Series

- Long-Life version of KZH series
- Endurance with ripple current : 6,000 to 10,000 hours at 105°C
- Newly innovative electrolyte is employed to minimize ESR
- Rated voltage range : 6.3 to 50V<sub>dc</sub>, Nominal capacitance range : 27 to 10,000μF
- Non solvent resistant type
- RoHS2 Compliant

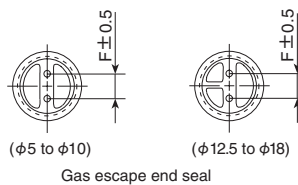
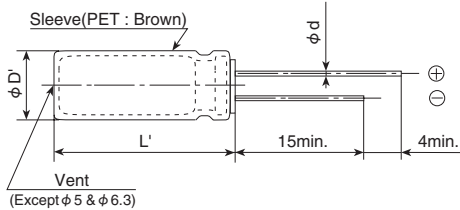


## SPECIFICATIONS

| Items   | Characteristics   |  |
|---|---|--|
| <b>Category</b>   | -40 to +105°C   |  |
| <b>Temperature Range</b>                                      |   |  |
| <b>Rated Voltage Range</b>                                    | 6.3 to 50V <sub>dc</sub>  |  |
| <b>Capacitance Tolerance</b>                                  | ±20% (M) (at 20°C, 120Hz)   |  |
| <b>Leakage Current</b>  | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)   |  |
| <b>Dissipation Factor (tan δ)</b>                             | Rated voltage (V <sub>dc</sub> )  | 6.3V 10V 16V 25V 35V 50V   |
|   | tan δ (Max.)  | 0.22 0.19 0.16 0.14 0.12 0.10  |
|   | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)   |  |
| <b>Low Temperature Characteristics (Max. Impedance Ratio)</b> | Z (-25°C) / Z (+20°C)   | 2max.  |
|   | Z (-40°C) / Z (+20°C)   | 3max.  |
| <b>Endurance</b>  | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for the specified period of time at 105°C.                      |  |
|   | Time  | φ 5 & φ 6.3 : 6,000hours φ 8 : 8,000hours φ 10 to φ 18 : 10,000hours |
|   | Capacitance change  | ≤ ±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤ ± 30%)       |
|   | D.F. (tan δ)  | ≤200% of the initial specified value                                 |
|   | Leakage current   | ≤ The initial specified value  |
| <b>Shelf Life</b>   | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |  |
|   | Capacitance change  | ≤ ±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤ ±30%)        |
|   | D.F. (tan δ)  | ≤200% of the initial specified value                                 |
|   | Leakage current   | ≤ The initial specified value  |

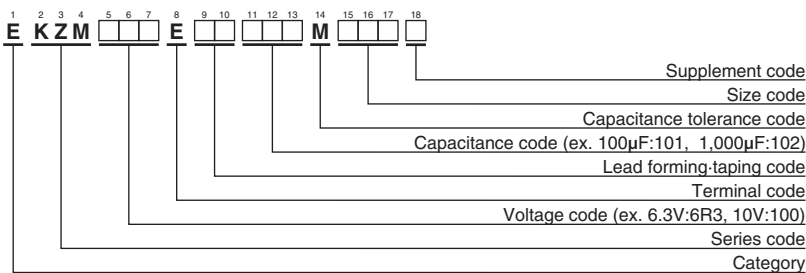
## DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) |      |      |      |
|-----------------|---------------|------|------|------|
|                 | 120           | 1k   | 10k  | 100k |
| 27 to 180       | 0.40          | 0.75 | 0.90 | 1.00 |
| 220 to 560      | 0.50          | 0.85 | 0.94 | 1.00 |
| 680 to 1,800    | 0.60          | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900  | 0.75          | 0.90 | 0.95 | 1.00 |
| 4,700 to 10,000 | 0.85          | 0.95 | 0.98 | 1.00 |

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

**KZM Series**
**◆STANDARD RATINGS**

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Impedance<br>(Ω max./100kHz) |       | Rated ripple current<br>(mArms/105°C, 100kHz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|------------------------------|-------|---|--------------------|
|                          |             |                       |       | 20°C                         | -10°C |   |                    |
| 6.3                      | 220         | 5 × 11                | 0.22  | 0.22                         | 0.80  | 345   | EKZM6R3E□□221ME11D |
|                          | 470         | 6.3 × 11              | 0.22  | 0.094                        | 0.35  | 540   | EKZM6R3E□□471MF11D |
|                          | 820         | 8 × 11.5              | 0.22  | 0.056                        | 0.19  | 945   | EKZM6R3E□□821MHB5D |
|                          | 1,200       | 8 × 15                | 0.22  | 0.045                        | 0.15  | 1,250   | EKZM6R3E□□122MH15D |
|                          | 1,200       | 10 × 12.5             | 0.22  | 0.039                        | 0.14  | 1,330   | EKZM6R3E□□122MJC5S |
|                          | 1,500       | 8 × 20                | 0.22  | 0.029                        | 0.11  | 1,500   | EKZM6R3E□□152MH20D |
|                          | 1,800       | 10 × 16               | 0.22  | 0.028                        | 0.10  | 1,760   | EKZM6R3E□□182MJ16S |
|                          | 2,200       | 10 × 20               | 0.24  | 0.020                        | 0.060 | 1,960   | EKZM6R3E□□222MJ20S |
|                          | 2,700       | 10 × 25               | 0.24  | 0.018                        | 0.054 | 2,250   | EKZM6R3E□□272MJ25S |
|                          | 3,900       | 12.5 × 20             | 0.26  | 0.017                        | 0.043 | 2,480   | EKZM6R3E□□392MK20S |
|                          | 4,700       | 12.5 × 25             | 0.28  | 0.015                        | 0.038 | 2,900   | EKZM6R3E□□472MK25S |
|                          | 5,600       | 12.5 × 30             | 0.30  | 0.013                        | 0.033 | 3,450   | EKZM6R3E□□562MK30S |
|                          | 6,800       | 12.5 × 35             | 0.32  | 0.012                        | 0.031 | 3,570   | EKZM6R3E□□682MK35S |
|                          | 6,800       | 16 × 20               | 0.32  | 0.015                        | 0.038 | 3,250   | EKZM6R3E□□682ML20S |
| 8,200                    | 16 × 25     | 0.36                  | 0.013 | 0.035                        | 3,630 | EKZM6R3E□□822ML25S                            |                    |
| 10,000                   | 18 × 25     | 0.40                  | 0.012 | 0.031                        | 3,650 | EKZM6R3E□□103MM25S                            |                    |
| 10                       | 150         | 5 × 11                | 0.19  | 0.22                         | 0.80  | 345   | EKZM100E□□151ME11D |
|                          | 330         | 6.3 × 11              | 0.19  | 0.094                        | 0.35  | 540   | EKZM100E□□331MF11D |
|                          | 680         | 8 × 11.5              | 0.19  | 0.056                        | 0.19  | 945   | EKZM100E□□681MHB5D |
|                          | 1,000       | 8 × 15                | 0.19  | 0.045                        | 0.15  | 1,250   | EKZM100E□□102MH15D |
|                          | 1,000       | 10 × 12.5             | 0.19  | 0.039                        | 0.14  | 1,330   | EKZM100E□□102MJC5S |
|                          | 1,500       | 8 × 20                | 0.19  | 0.029                        | 0.11  | 1,500   | EKZM100E□□152MH20D |
|                          | 1,500       | 10 × 16               | 0.19  | 0.028                        | 0.10  | 1,760   | EKZM100E□□152MJ16S |
|                          | 1,800       | 10 × 20               | 0.19  | 0.020                        | 0.060 | 1,960   | EKZM100E□□182MJ20S |
|                          | 2,200       | 10 × 25               | 0.21  | 0.018                        | 0.054 | 2,250   | EKZM100E□□222MJ25S |
|                          | 3,300       | 12.5 × 20             | 0.23  | 0.017                        | 0.043 | 2,480   | EKZM100E□□332MK20S |
|                          | 3,900       | 12.5 × 25             | 0.23  | 0.015                        | 0.038 | 2,900   | EKZM100E□□392MK25S |
|                          | 4,700       | 12.5 × 30             | 0.25  | 0.013                        | 0.033 | 3,450   | EKZM100E□□472MK30S |
|                          | 4,700       | 16 × 20               | 0.25  | 0.015                        | 0.038 | 3,250   | EKZM100E□□472ML20S |
|                          | 5,600       | 12.5 × 35             | 0.27  | 0.012                        | 0.031 | 3,570   | EKZM100E□□562MK35S |
| 6,800                    | 16 × 25     | 0.29                  | 0.013 | 0.035                        | 3,630 | EKZM100E□□682ML25S                            |                    |
| 8,200                    | 18 × 25     | 0.33                  | 0.012 | 0.031                        | 3,650 | EKZM100E□□822MM25S                            |                    |
| 16                       | 100         | 5 × 11                | 0.16  | 0.22                         | 0.80  | 345   | EKZM160E□□101ME11D |
|                          | 220         | 6.3 × 11              | 0.16  | 0.094                        | 0.35  | 540   | EKZM160E□□221MF11D |
|                          | 470         | 8 × 11.5              | 0.16  | 0.056                        | 0.19  | 945   | EKZM160E□□471MHB5D |
|                          | 680         | 8 × 15                | 0.16  | 0.045                        | 0.15  | 1,250   | EKZM160E□□681MH15D |
|                          | 680         | 10 × 12.5             | 0.16  | 0.039                        | 0.14  | 1,330   | EKZM160E□□681MJC5S |
|                          | 1,000       | 8 × 20                | 0.16  | 0.029                        | 0.11  | 1,500   | EKZM160E□□102MH20D |
|                          | 1,000       | 10 × 16               | 0.16  | 0.028                        | 0.10  | 1,760   | EKZM160E□□102MJ16S |
|                          | 1,500       | 10 × 20               | 0.16  | 0.020                        | 0.060 | 1,960   | EKZM160E□□152MJ20S |
|                          | 1,800       | 10 × 25               | 0.16  | 0.018                        | 0.054 | 2,250   | EKZM160E□□182MJ25S |
|                          | 2,200       | 12.5 × 20             | 0.18  | 0.017                        | 0.043 | 2,480   | EKZM160E□□222MK20S |
|                          | 2,700       | 12.5 × 25             | 0.18  | 0.015                        | 0.038 | 2,900   | EKZM160E□□272MK25S |
|                          | 3,300       | 12.5 × 30             | 0.20  | 0.013                        | 0.033 | 3,450   | EKZM160E□□332MK30S |
|                          | 3,300       | 16 × 20               | 0.20  | 0.015                        | 0.038 | 3,250   | EKZM160E□□332ML20S |
|                          | 3,900       | 12.5 × 35             | 0.20  | 0.012                        | 0.031 | 3,570   | EKZM160E□□392MK35S |
|                          | 4,700       | 16 × 25               | 0.22  | 0.013                        | 0.035 | 3,630   | EKZM160E□□472ML25S |
|                          | 5,600       | 18 × 25               | 0.24  | 0.012                        | 0.031 | 3,650   | EKZM160E□□562MM25S |

□□ : Enter the appropriate lead forming or taping code.

**KZM Series**
**◆STANDARD RATINGS**

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Impedance<br>(Ω max./100kHz) |       | Rated ripple current<br>(mArms/105°C, 100kHz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|------------------------------|-------|---|--------------------|
|                          |             |                       |       | 20°C                         | -10°C |   |                    |
| 25                       | 68          | 5 × 11                | 0.14  | 0.22                         | 0.80  | 345   | EKZM250E□□680ME11D |
|                          | 150         | 6.3 × 11              | 0.14  | 0.094                        | 0.35  | 540   | EKZM250E□□151MF11D |
|                          | 330         | 8 × 11.5              | 0.14  | 0.056                        | 0.19  | 945   | EKZM250E□□331MHB5D |
|                          | 390         | 8 × 15                | 0.14  | 0.045                        | 0.15  | 1,250   | EKZM250E□□391MH15D |
|                          | 470         | 10 × 12.5             | 0.14  | 0.039                        | 0.14  | 1,330   | EKZM250E□□471MJC5S |
|                          | 560         | 8 × 20                | 0.14  | 0.029                        | 0.11  | 1,500   | EKZM250E□□561MH20D |
|                          | 680         | 10 × 16               | 0.14  | 0.028                        | 0.10  | 1,760   | EKZM250E□□681MJ16S |
|                          | 820         | 10 × 20               | 0.14  | 0.020                        | 0.060 | 1,960   | EKZM250E□□821MJ20S |
|                          | 1,000       | 10 × 25               | 0.14  | 0.018                        | 0.054 | 2,250   | EKZM250E□□102MJ25S |
|                          | 1,500       | 12.5 × 20             | 0.14  | 0.017                        | 0.043 | 2,480   | EKZM250E□□152MK20S |
|                          | 1,800       | 12.5 × 25             | 0.14  | 0.015                        | 0.038 | 2,900   | EKZM250E□□182MK25S |
|                          | 2,200       | 12.5 × 30             | 0.16  | 0.013                        | 0.033 | 3,450   | EKZM250E□□222MK30S |
|                          | 2,200       | 16 × 20               | 0.16  | 0.015                        | 0.038 | 3,250   | EKZM250E□□222ML20S |
|                          | 2,700       | 12.5 × 35             | 0.16  | 0.012                        | 0.031 | 3,570   | EKZM250E□□272MK35S |
| 3,300                    | 16 × 25     | 0.18                  | 0.013 | 0.035                        | 3,630 | EKZM250E□□332ML25S                            |                    |
| 3,900                    | 18 × 25     | 0.18                  | 0.012 | 0.031                        | 3,650 | EKZM250E□□392MM25S                            |                    |
| 35                       | 47          | 5 × 11                | 0.12  | 0.22                         | 0.80  | 345   | EKZM350E□□470ME11D |
|                          | 100         | 6.3 × 11              | 0.12  | 0.094                        | 0.35  | 540   | EKZM350E□□101MF11D |
|                          | 220         | 8 × 11.5              | 0.12  | 0.056                        | 0.19  | 945   | EKZM350E□□221MHB5D |
|                          | 270         | 8 × 15                | 0.12  | 0.045                        | 0.15  | 1,250   | EKZM350E□□271MH15D |
|                          | 330         | 10 × 12.5             | 0.12  | 0.039                        | 0.14  | 1,330   | EKZM350E□□331MJC5S |
|                          | 390         | 8 × 20                | 0.12  | 0.029                        | 0.11  | 1,500   | EKZM350E□□391MH20D |
|                          | 470         | 10 × 16               | 0.12  | 0.028                        | 0.10  | 1,760   | EKZM350E□□471MJ16S |
|                          | 560         | 10 × 20               | 0.12  | 0.020                        | 0.060 | 1,960   | EKZM350E□□561MJ20S |
|                          | 680         | 10 × 25               | 0.12  | 0.018                        | 0.054 | 2,250   | EKZM350E□□681MJ25S |
|                          | 1,000       | 12.5 × 20             | 0.12  | 0.017                        | 0.043 | 2,480   | EKZM350E□□102MK20S |
|                          | 1,200       | 12.5 × 25             | 0.12  | 0.015                        | 0.038 | 2,900   | EKZM350E□□122MK25S |
|                          | 1,500       | 12.5 × 30             | 0.12  | 0.013                        | 0.033 | 3,450   | EKZM350E□□152MK30S |
|                          | 1,500       | 16 × 20               | 0.12  | 0.015                        | 0.038 | 3,250   | EKZM350E□□152ML20S |
|                          | 1,800       | 12.5 × 35             | 0.12  | 0.012                        | 0.031 | 3,570   | EKZM350E□□182MK35S |
| 2,200                    | 16 × 25     | 0.14                  | 0.013 | 0.035                        | 3,630 | EKZM350E□□222ML25S                            |                    |
| 2,700                    | 18 × 25     | 0.14                  | 0.012 | 0.031                        | 3,650 | EKZM350E□□272MM25S                            |                    |
| 50                       | 27          | 5 × 11                | 0.10  | 0.34                         | 1.18  | 238   | EKZM500E□□270ME11D |
|                          | 56          | 6.3 × 11              | 0.10  | 0.14                         | 0.50  | 385   | EKZM500E□□560MF11D |
|                          | 100         | 8 × 11.5              | 0.10  | 0.074                        | 0.22  | 724   | EKZM500E□□101MHB5D |
|                          | 120         | 8 × 15                | 0.10  | 0.061                        | 0.18  | 950   | EKZM500E□□121MH15D |
|                          | 150         | 10 × 12.5             | 0.10  | 0.061                        | 0.18  | 979   | EKZM500E□□151MJC5S |
|                          | 180         | 8 × 20                | 0.10  | 0.046                        | 0.14  | 1,190   | EKZM500E□□181MH20D |
|                          | 220         | 10 × 16               | 0.10  | 0.042                        | 0.12  | 1,370   | EKZM500E□□221MJ16S |
|                          | 270         | 10 × 20               | 0.10  | 0.030                        | 0.090 | 1,580   | EKZM500E□□271MJ20S |
|                          | 330         | 10 × 25               | 0.10  | 0.028                        | 0.085 | 1,870   | EKZM500E□□331MJ25S |
|                          | 470         | 12.5 × 20             | 0.10  | 0.027                        | 0.068 | 2,050   | EKZM500E□□471MK30S |
|                          | 560         | 12.5 × 25             | 0.10  | 0.023                        | 0.059 | 2,410   | EKZM500E□□561MK25S |
|                          | 680         | 12.5 × 30             | 0.10  | 0.021                        | 0.052 | 2,860   | EKZM500E□□681MK30S |
|                          | 820         | 12.5 × 35             | 0.10  | 0.019                        | 0.051 | 2,960   | EKZM500E□□821MK35S |
|                          | 820         | 16 × 20               | 0.10  | 0.023                        | 0.059 | 2,730   | EKZM500E□□821ML20S |
| 1,000                    | 16 × 25     | 0.10                  | 0.021 | 0.056                        | 3,010 | EKZM500E□□102ML25S                            |                    |
| 1,500                    | 18 × 25     | 0.10                  | 0.019 | 0.051                        | 3,290 | EKZM500E□□152MM25S                            |                    |

□□ : Enter the appropriate lead forming or taping code.