

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

**LK**

Snap-in Terminal Type, Standard series

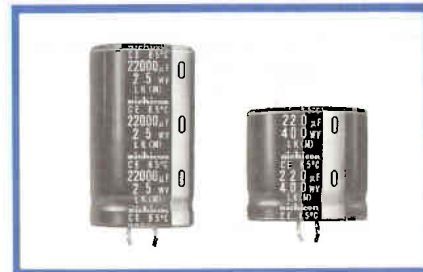
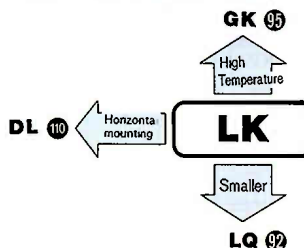


RCJ Approved An-Solvent Feature Through 00V only



Approved by Reliability Center for Electronic Component, Japan Certification No. RCJ-03-25C

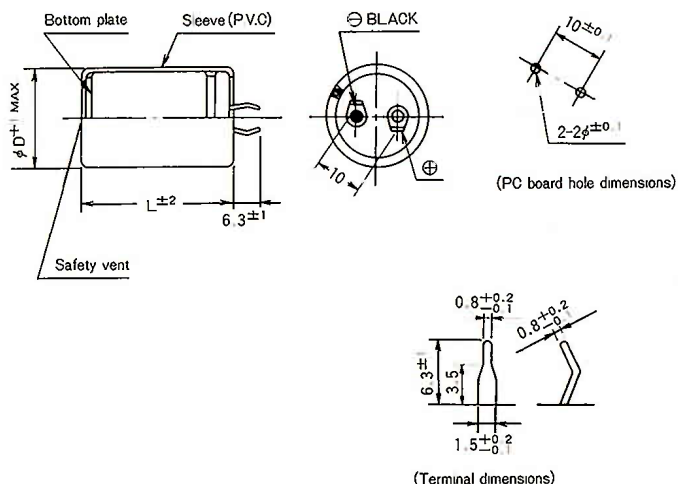
- Standard snap-in terminal series
- Extended capacitance ranges based on the numerical values in E12 series under JIS



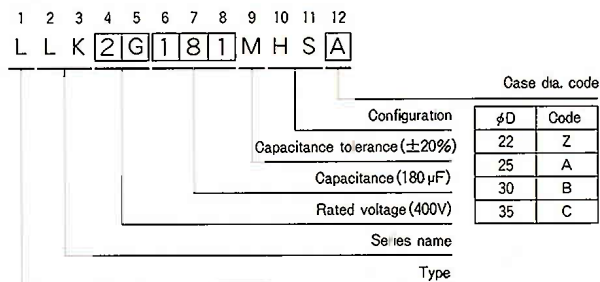
## Specifications

| Item                         | Performance Characteristics                                                                                                                                                                            |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------|------|-----|------|----------------------|-----|-----------------------------------------|------|---------|------|------|---|
| Operating Temperature Range  | -40~+85°C (16~250V)                                                                                                                                                                                    |                 |        |      |     |      | -25~+85°C (400~450V) |     |                                         |      |         |      |      |   |
| Voltage Range                | 16~450V                                                                                                                                                                                                |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Capacitance Range            | 47~33000μF                                                                                                                                                                                             |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Capacitance Tolerance        | ±20% (120Hz 20°C)                                                                                                                                                                                      |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Leakage Current              | $I \leq 3 \sqrt{CV}$ (μA) (After 5 minutes' application of rated voltage) [C: Capacitance (μF) V: Voltage (V)]                                                                                         |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| tan δ                        | Measurement frequency 120Hz Temperature 20°C                                                                                                                                                           |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
|                              | Rated voltage (V)                                                                                                                                                                                      | 16              | 25     | 35   | 50  | 63   | 80                   | 100 | 160                                     | 200  | 250     | 400  | 450  |   |
|                              | tan δ (MAX.)                                                                                                                                                                                           | 0.5             | 0.4    | 0.35 | 0.3 | 0.25 | 0.2                  | 0.2 | 0.15                                    | 0.10 | 0.10    | 0.20 | 0.20 |   |
| Stability at Low Temperature | Measurement frequency 120Hz                                                                                                                                                                            |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
|                              | Rated voltage (V)                                                                                                                                                                                      |                 | 16~100 |      |     |      | 160~250              |     |                                         |      | 400~450 |      |      |   |
|                              | Impedance ratio                                                                                                                                                                                        | Z-25°C / Z+20°C |        |      |     | 4    |                      |     |                                         | 3    |         |      |      | 8 |
|                              | ZT/Z20 (MAX.)                                                                                                                                                                                          | Z-40°C / Z+20°C |        |      |     | 15   |                      |     |                                         | 12   |         |      |      | — |
| Load Life                    | After an application of rated voltage (maximum value of DC voltage overlapped by an allowable ripple current) for 2000 hours at 85°C, capacitors meet the characteristics requirements listed at right |                 |        |      |     |      | Leakage current      |     | Initial specified value or less         |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      | Capacitance change   |     | Within ±20% of initial value            |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      | tan δ                |     | 200% or less of initial specified value |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Shelf Life                   | After leaving capacitors under no load at 85°C for 1000 hours, they meet the requirements listed at right                                                                                              |                 |        |      |     |      | Leakage current      |     | Initial specified value or less         |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      | Capacitance change   |     | Within ±15% of initial value            |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      | tan δ                |     | 150% or less of initial specified value |      |         |      |      |   |
|                              |                                                                                                                                                                                                        |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Marking                      | Printed with white color letter on black sleeve                                                                                                                                                        |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |
| Applicable Standards         | JIS C-5141 and JIS C-5102                                                                                                                                                                              |                 |        |      |     |      |                      |     |                                         |      |         |      |      |   |

## Drawing



## Type numbering system (Example: 400V 180μF)



# ALUMINUM ELECTROLYTIC CAPACITORS

**LK** series

## ■ Dimensions

DXL (mm)

| Cap. (μF) | V (Code)<br>Code | φD    | 16 (1C) |       |       |    | 25 (1E) |       |       |       | 35 (1V) |       |       |       | 50 (1H) |       |       |       |
|-----------|------------------|-------|---------|-------|-------|----|---------|-------|-------|-------|---------|-------|-------|-------|---------|-------|-------|-------|
|           |                  |       | 22      | 25    | 30    | 35 | 22      | 25    | 30    | 35    | 22      | 25    | 30    | 35    | 22      | 25    | 30    | 35    |
| 2200      | 222              |       |         |       |       |    |         |       |       |       |         |       |       |       | 22×25   |       |       |       |
|           |                  |       |         |       |       |    |         |       |       |       |         |       |       |       | 1.85    |       |       |       |
| 2700      | 272              |       |         |       |       |    |         |       |       |       |         |       |       |       | 22×30   |       |       |       |
|           |                  |       |         |       |       |    |         |       |       |       |         |       |       |       | 2.10    |       |       |       |
| 3300      | 332              |       |         |       |       |    |         |       |       |       | 22×25   |       |       |       | 22×35   | 25×25 |       |       |
|           |                  |       |         |       |       |    |         |       |       |       | 2.20    |       |       |       | 2.35    | 2.35  |       |       |
| 3900      | 392              |       |         |       |       |    |         |       |       |       | 22×30   |       |       |       | 22×35   | 25×30 |       |       |
|           |                  |       |         |       |       |    |         |       |       |       | 2.25    |       |       |       | 2.50    | 2.50  |       |       |
| 4700      | 472              |       |         |       |       |    | 22×25   |       |       |       | 22×30   | 25×25 |       |       | 22×40   | 25×35 | 30×25 |       |
|           |                  |       |         |       |       |    | 1.90    |       |       |       | 2.40    | 2.40  |       |       | 2.80    | 2.80  | 2.80  |       |
| 5600      | 562              |       |         |       |       |    | 22×30   |       |       |       | 22×35   | 25×30 |       |       | 22×45   | 25×40 | 30×30 |       |
|           |                  |       |         |       |       |    | 2.25    |       |       |       | 2.75    | 2.75  |       |       | 3.30    | 3.30  | 3.30  |       |
| 6800      | 682              | 22×25 |         |       |       |    | 22×35   | 25×25 |       |       | 22×40   | 25×35 | 30×25 |       | 22×50   | 25×40 | 30×35 |       |
|           |                  | 2.50  |         |       |       |    | 2.55    | 2.55  |       |       | 2.95    | 2.95  | 2.95  |       | 3.80    | 3.80  | 3.80  |       |
| 8200      | 822              | 22×30 |         |       |       |    | 22×40   | 25×30 | 30×25 |       | 22×45   | 25×40 | 30×30 |       |         | 25×50 | 30×40 | 35×30 |
|           |                  | 2.65  |         |       |       |    | 3.10    | 3.10  | 3.20  |       | 3.45    | 3.50  | 3.45  |       |         | 4.30  | 4.35  | 4.25  |
| 10000     | 103              | 22×30 | 25×25   |       |       |    | 22×45   | 25×35 | 30×30 |       |         | 25×45 | 30×35 |       |         |       | 30×45 | 35×35 |
|           |                  | 2.85  | 2.85    |       |       |    | 3.40    | 3.40  | 3.40  |       |         | 4.00  | 4.00  |       |         |       | 4.75  | 4.70  |
| 12000     | 123              | 22×35 | 25×30   |       |       |    | 22×50   | 25×40 | 30×30 |       |         | 25×50 | 30×40 | 35×30 |         |       | 30×50 | 35×40 |
|           |                  | 3.25  | 3.25    |       |       |    | 4.00    | 3.90  | 3.85  |       |         | 4.45  | 4.50  | 4.40  |         |       | 5.30  | 5.25  |
| 15000     | 153              | 22×40 | 25×35   | 30×25 |       |    |         | 25×45 | 30×35 | 35×30 |         |       | 30×45 | 35×35 |         |       |       | 35×45 |
|           |                  | 3.70  | 3.75    | 3.65  |       |    |         | 3.75  | 4.45  | 4.45  |         |       | 5.00  | 5.00  |         |       |       | 5.90  |
| 18000     | 183              | 22×50 | 25×40   | 30×30 |       |    |         |       | 30×40 | 35×35 |         |       | 30×50 | 35×40 |         |       |       | 35×50 |
|           |                  | 4.35  | 4.25    | 4.20  |       |    |         |       | 5.00  | 5.10  |         |       | 5.55  | 5.50  |         |       |       | 6.50  |
| 22000     | 223              |       | 25×45   | 30×35 | 35×30 |    |         |       | 30×50 | 35×40 |         |       |       | 35×50 |         |       |       |       |
|           |                  |       | 4.80    | 4.80  | 4.80  |    |         |       | 5.80  | 5.75  |         |       |       | 6.25  |         |       |       |       |
| 27000     | 273              |       |         | 30×40 | 35×30 |    |         |       |       | 35×50 |         |       |       |       |         |       |       |       |
|           |                  |       |         | 5.20  | 5.15  |    |         |       |       | 6.60  |         |       |       |       |         |       |       |       |
| 33000     | 333              |       |         | 30×45 | 35×40 |    |         |       |       |       |         |       |       |       |         |       |       |       |
|           |                  |       |         | 5.80  | 5.90  |    |         |       |       |       |         |       |       |       |         |       |       |       |

| Cap. (μF) | V (Code)<br>Code | φD    | 63 (1J) |       |       |    | 80 (1K) |       |       |       | 100 (2A) |       |       |       |
|-----------|------------------|-------|---------|-------|-------|----|---------|-------|-------|-------|----------|-------|-------|-------|
|           |                  |       | 22      | 25    | 30    | 35 | 22      | 25    | 30    | 35    | 22       | 25    | 30    | 35    |
| 820       | 821              |       |         |       |       |    |         |       |       |       | 22×25    |       |       |       |
|           |                  |       |         |       |       |    |         |       |       |       | 1.20     |       |       |       |
| 1000      | 102              |       |         |       |       |    |         |       |       |       | 22×30    | 25×25 |       |       |
|           |                  |       |         |       |       |    |         |       |       |       | 1.50     | 1.50  |       |       |
| 1200      | 122              |       |         |       |       |    | 22×25   |       |       |       | 22×35    | 25×30 |       |       |
|           |                  |       |         |       |       |    | 1.30    |       |       |       | 1.75     | 1.75  |       |       |
| 1500      | 152              |       |         |       |       |    | 22×30   | 25×25 |       |       | 22×40    | 25×30 | 30×25 |       |
|           |                  |       |         |       |       |    | 1.80    | 1.80  |       |       | 1.95     | 1.90  | 1.95  |       |
| 1800      | 182              | 22×25 |         |       |       |    | 22×35   | 25×30 |       |       | 22×45    | 25×35 | 30×30 |       |
|           |                  | 1.70  |         |       |       |    | 2.05    | 2.05  |       |       | 2.30     | 2.20  | 2.30  |       |
| 2200      | 222              | 22×30 | 25×25   |       |       |    | 22×40   | 25×30 | 30×25 |       | 22×50    | 25×40 | 30×30 |       |
|           |                  | 2.30  | 2.30    |       |       |    | 2.30    | 2.30  | 2.30  |       | 2.65     | 2.60  | 2.55  |       |
| 2700      | 272              | 22×35 | 25×30   |       |       |    | 22×45   | 25×35 | 30×30 |       |          | 25×45 | 30×35 | 35×30 |
|           |                  | 2.40  | 2.45    |       |       |    | 2.50    | 2.45  | 2.50  |       |          | 2.85  | 2.85  | 2.95  |
| 3300      | 332              | 22×40 | 25×35   | 30×25 |       |    | 22×50   | 25×40 | 30×30 |       |          |       | 30×40 | 35×35 |
|           |                  | 2.75  | 2.80    | 2.75  |       |    | 2.95    | 2.85  | 2.80  |       |          |       | 3.45  | 3.45  |
| 3900      | 392              | 22×45 | 25×35   | 30×30 |       |    |         | 25×45 | 30×35 |       |          |       | 30×45 | 35×35 |
|           |                  | 3.00  | 2.90    | 3.00  |       |    |         | 3.20  | 3.20  |       |          |       | 3.85  | 3.75  |
| 4700      | 472              | 22×50 | 25×40   | 30×30 |       |    |         | 25×50 | 30×40 | 35×30 |          |       |       | 35×40 |
|           |                  | 3.30  | 3.25    | 3.20  |       |    |         | 3.75  | 3.80  | 3.70  |          |       |       | 4.30  |
| 5600      | 562              |       | 25×45   | 30×35 |       |    |         |       | 30×45 | 35×35 |          |       |       | 35×50 |
|           |                  |       | 3.75    | 3.75  |       |    |         |       | 4.40  | 4.35  |          |       |       | 5.10  |
| 6800      | 682              |       |         | 30×40 | 35×30 |    |         |       | 30×50 | 35×40 |          |       |       |       |
|           |                  |       |         | 4.20  | 4.15  |    |         |       | 4.80  | 4.80  |          |       |       |       |
| 8200      | 822              |       |         | 30×45 | 35×35 |    |         |       |       | 35×45 |          |       |       |       |
|           |                  |       |         | 4.70  | 4.65  |    |         |       |       | 5.35  |          |       |       |       |
| 10000     | 103              |       |         |       | 35×40 |    |         |       |       |       |          |       |       |       |
|           |                  |       |         |       | 5.20  |    |         |       |       |       |          |       |       |       |
| 12000     | 123              |       |         |       | 35×50 |    |         |       |       |       |          |       |       |       |
|           |                  |       |         |       | 6.10  |    |         |       |       |       |          |       |       |       |

Allowable Ripple (A) at 85°C 120Hz

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

LK series

## ■ Dimensions

D×L(mm)

| V (Code)  |      | 160(2C)       |               |               |               | 200(2D)       |               |               |               | 250(2E)       |               |               |               |
|-----------|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Cap. (μF) | Code | 22            | 25            | 30            | 35            | 22            | 25            | 30            | 35            | 22            | 25            | 30            | 35            |
| 180       | 181  |               |               |               |               |               |               |               |               | 22×25<br>0.95 |               |               |               |
| 220       | 221  |               |               |               |               | 22×25<br>1.10 |               |               |               | 22×30<br>1.15 | 25×25<br>1.15 |               |               |
| 270       | 271  |               |               |               |               | 22×30<br>1.25 |               |               |               | 22×35<br>1.25 | 25×30<br>1.25 |               |               |
| 330       | 331  | 22×25<br>1.30 |               |               |               | 22×30<br>1.40 | 25×25<br>1.40 |               |               | 22×40<br>1.45 | 25×30<br>1.45 | 30×25<br>1.45 |               |
| 390       | 391  | 22×30<br>1.50 | 25×25<br>1.55 |               |               | 22×35<br>1.60 | 25×30<br>1.60 |               |               | 22×45<br>1.70 | 25×35<br>1.70 | 30×30<br>1.70 |               |
| 470       | 471  | 22×35<br>1.75 | 25×30<br>1.75 |               |               | 22×40<br>1.80 | 25×35<br>1.80 | 30×25<br>1.75 |               | 22×50<br>1.90 | 25×40<br>1.90 | 30×35<br>1.90 | 35×25<br>1.90 |
| 560       | 561  | 22×35<br>1.90 | 25×30<br>1.90 | 30×25<br>1.95 |               | 22×45<br>2.00 | 25×35<br>2.00 | 30×30<br>2.05 |               |               | 25×45<br>2.15 | 30×35<br>2.15 | 35×30<br>2.15 |
| 680       | 681  | 22×40<br>2.15 | 25×35<br>2.20 | 30×30<br>2.20 |               |               | 25×40<br>2.25 | 30×35<br>2.25 | 35×25<br>2.30 |               |               | 30×40<br>2.40 | 35×30<br>2.35 |
| 820       | 821  | 22×50<br>2.45 | 25×40<br>2.45 | 30×30<br>2.45 | 35×25<br>2.50 |               | 25×50<br>2.55 | 30×40<br>2.60 | 35×30<br>2.50 |               |               | 30×45<br>2.75 | 35×35<br>2.75 |
| 1000      | 102  |               | 25×45<br>2.80 | 30×35<br>2.80 | 35×30<br>2.85 |               |               | 30×45<br>2.95 | 35×35<br>2.90 |               |               |               | 35×40<br>3.00 |
| 1200      | 122  |               | 25×50<br>3.10 | 30×40<br>3.20 | 35×35<br>3.25 |               |               | 30×50<br>3.40 | 35×40<br>3.40 |               |               |               | 35×50<br>3.50 |
| 1500      | 152  |               |               | 30×45<br>3.70 | 35×40<br>3.75 |               |               |               | 35×45<br>3.80 |               |               |               |               |
| 1800      | 182  |               |               |               | 35×40<br>4.00 |               |               |               | 35×50<br>4.15 |               |               |               |               |
| 2200      | 222  |               |               |               | 35×50<br>4.50 |               |               |               |               |               |               |               |               |

| V (Code)  |      | 400(2G)       |               |               |               | 450(2W)       |               |               |               |
|-----------|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Cap. (μF) | Code | 22            | 25            | 30            | 35            | 22            | 25            | 30            | 35            |
| 47        | 470  |               |               |               |               | 22×25<br>0.49 |               |               |               |
| 56        | 560  |               |               |               |               | 22×30<br>0.57 |               |               |               |
| 68        | 680  | 22×25<br>0.58 |               |               |               | 22×30<br>0.63 | 25×25<br>0.63 |               |               |
| 82        | 820  | 22×30<br>0.60 |               |               |               | 22×35<br>0.74 | 25×30<br>0.75 |               |               |
| 100       | 101  | 22×30<br>0.77 | 25×25<br>0.77 |               |               | 22×40<br>0.88 | 25×35<br>0.89 | 30×25<br>0.86 |               |
| 120       | 121  | 22×35<br>0.86 | 25×30<br>0.86 |               |               | 22×45<br>0.96 | 25×40<br>0.98 | 30×30<br>0.96 | 35×25<br>0.99 |
| 150       | 151  | 22×40<br>0.97 | 25×30<br>0.92 | 30×25<br>0.96 |               |               | 25×45<br>1.10 | 30×35<br>1.10 | 35×30<br>1.13 |
| 180       | 181  | 22×45<br>1.10 | 25×35<br>1.06 | 30×30<br>1.11 | 35×25<br>1.13 |               | 25×50<br>1.24 | 30×40<br>1.18 | 35×30<br>1.22 |
| 220       | 221  | 22×50<br>1.25 | 25×40<br>1.22 | 30×35<br>1.28 | 35×30<br>1.32 |               |               | 30×45<br>1.42 | 35×35<br>1.40 |
| 270       | 271  |               | 25×50<br>1.39 | 30×40<br>1.47 | 35×30<br>1.46 |               |               | 30×50<br>1.62 | 35×40<br>1.61 |
| 330       | 331  |               |               | 30×45<br>1.68 | 35×35<br>1.70 |               |               |               | 35×45<br>1.83 |
| 390       | 391  |               |               | 30×50<br>1.95 | 35×40<br>1.93 |               |               |               | 35×50<br>2.10 |
| 470       | 471  |               |               |               | 35×45<br>2.23 |               |               |               |               |
| 560       | 561  |               |               |               | 35×50<br>2.54 |               |               |               |               |

Allowable Ripple (A) at 85°C 120Hz

### ● Frequency coefficient of allowable ripple current

| Frequency (Hz) | 50   | 60   | 120  | 1 k  | 10k~ |
|----------------|------|------|------|------|------|
| 16~100V        | 0.88 | 0.90 | 1.00 | 1.15 | 1.15 |
| 160~250V       | 0.85 | 0.88 | 1.00 | 1.15 | 1.20 |
| 400~450V       | 0.88 | 0.90 | 1.00 | 1.10 | 1.15 |

### ● Allowable ripple current vs. Ambient temperature

| Ambient temp. (°C) | ~+45 | +60  | +70  | +85  |
|--------------------|------|------|------|------|
| Coefficient        | 1.48 | 1.42 | 1.30 | 1.00 |