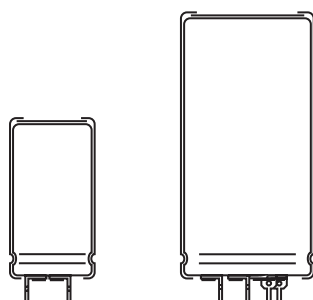


## Aluminum Capacitors Power Printed Wiring Style



Component outlines

### QUICK REFERENCE DATA

| DESCRIPTION                                       | VALUE                             |                               |
|---------------------------------------------------|-----------------------------------|-------------------------------|
| Nominal case size<br>( $\varnothing$ D x L in mm) | 25 x 30 to 40 x 100               |                               |
| Rated capacitance range<br>(E6 series), $C_R$     | 470 $\mu$ F to<br>150 000 $\mu$ F | 68 $\mu$ F to<br>3300 $\mu$ F |
| Tolerance on $C_R$                                | $\pm 20$ %                        |                               |
| Rated voltage range, $U_R$                        | 10 V to 100 V                     | 200 V to 400 V                |
| Category temperature range                        | - 40 °C to + 105 °C               |                               |
| Endurance test at 105 °C                          | 2000 h                            |                               |
| Useful life at 105 °C                             | 5000 h                            |                               |
| Useful life at 40 °C,<br>1.9 x $I_R$ applied      | 150 000 h                         |                               |
| Shelf life at 0 V, 105 °C                         | 500 h                             |                               |
| Based on sectional specification                  | IEC 60384-4/EN130300              |                               |
| Climatic category IEC 60068                       | 40/105/56                         |                               |

### FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Large types, minimized dimensions, cylindrical aluminum case, insulated with a blue sleeve
- Provided with keyed polarity
- Very long useful life: 5000 h at 105 °C
- Low ESR, high ripple current capability
- Temperature range up to 105 °C
- High resistance to shock and vibration

RoHS  
COMPLIANT

### APPLICATIONS

- Computer, telecommunication and industrial systems
- Smoothing and filtering
- Standard and switched mode power supplies
- Energy storage in pulse systems

### MARKING

The capacitors are marked (where possible) with the following information:

- Rated capacitance (in  $\mu$ F)
- Tolerance on rated capacitance, code letter in accordance with IEC 60062 (M for  $\pm 20$  %)
- Rated voltage (in V)
- Date code (YYMM)
- Name of manufacturer
- Code for factory of origin
- Polarity of the terminals and '-' sign to indicate the negative terminal, visible from the top and/or side of the capacitor
- Code number
- Climatic category in accordance with IEC 60068

### SELECTION CHART FOR $C_R$ , $U_R$ AND RELEVANT NOMINAL CASE SIZES ( $\varnothing$ D x L in mm)

| $C_R$<br>( $\mu$ F) | $U_R$ (V) |          |          |          |          |          |
|---------------------|-----------|----------|----------|----------|----------|----------|
|                     | 10        | 16       | 25       | 40       | 63       | 100      |
| 470                 | -         | -        | -        | -        | -        | 25 x 30  |
| 680                 | -         | -        | -        | -        | -        | 25 x 40  |
| 1000                | -         | -        | -        | -        | 25 x 30  | 30 x 40  |
| 1500                | -         | -        | -        | -        | 25 x 40  | 35 x 40  |
| 2200                | -         | -        | -        | 25 x 30  | 30 x 40  | 35 x 50  |
|                     | -         | -        | -        | -        | -        | 40 x 40  |
| 3300                | -         | -        | -        | 25 x 40  | 35 x 40  | 40 x 50  |
| 4700                | -         | -        | 25 x 30  | 30 x 40  | 35 x 50  | 40 x 70  |
|                     | -         | -        | -        | -        | 40 x 40  | -        |
| 6800                | -         | 25 x 30  | 25 x 40  | 35 x 40  | 40 x 50  | 40 x 100 |
| 10 000              | 25 x 30   | 25 x 40  | 30 x 40  | 35 x 50  | 40 x 70  | -        |
|                     | -         | -        | -        | 40 x 40  | -        | -        |
| 15 000              | 25 x 40   | 30 x 40  | 35 x 40  | 40 x 50  | 40 x 100 | -        |
| 22 000              | 30 x 40   | 35 x 40  | 35 x 50  | 40 x 70  | -        | -        |
|                     | -         | -        | 40 x 40  | -        | -        | -        |
| 33 000              | 35 x 40   | 35 x 50  | 40 x 50  | 40 x 100 | -        | -        |
|                     | -         | 40 x 40  | -        | -        | -        | -        |
| 47 000              | 35 x 50   | 40 x 50  | 40 x 70  | -        | -        | -        |
|                     | 40 x 40   | -        | -        | -        | -        | -        |
| 68 000              | 40 x 50   | 40 x 70  | 40 x 100 | -        | -        | -        |
| 100 000             | 40 x 70   | 40 x 100 | -        | -        | -        | -        |
| 150 000             | 40 x 100  | -        | -        | -        | -        | -        |

| <b>SELECTION CHART FOR <math>C_R</math>, <math>U_R</math> AND RELEVANT NOMINAL CASE SIZES (<math>\varnothing D \times L</math> in mm)</b> |           |          |          |          |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|
| $C_R$<br>( $\mu F$ )                                                                                                                      | $U_R$ (V) |          |          |          |
|                                                                                                                                           | 200       | 250      | 385      | 400      |
| 68                                                                                                                                        | -         | -        | 25 x 30  | 25 x 30  |
| 100                                                                                                                                       | -         | 25 x 30  | 25 x 40  | 25 x 40  |
| 150                                                                                                                                       | 25 x 30   | 25 x 40  | 30 x 40  | 30 x 40  |
| 220                                                                                                                                       | 25 x 40   | 30 x 40  | 35 x 40  | 35 x 40  |
| 330                                                                                                                                       | 30 x 40   | 35 x 40  | 35 x 50  | 35 x 50  |
|                                                                                                                                           | -         | -        | 40 x 40  | 40 x 40  |
| 470                                                                                                                                       | 35 x 40   | 35 x 50  | 40 x 50  | 40 x 50  |
|                                                                                                                                           | -         | 40 x 40  | -        | -        |
| 680                                                                                                                                       | 35 x 50   | 40 x 50  | 40 x 70  | 40 x 70  |
|                                                                                                                                           | 40 x 50   | -        | -        | -        |
| 1000                                                                                                                                      | 40 x 50   | 40 x 70  | 40 x 100 | 40 x 100 |
| 1500                                                                                                                                      | 40 x 70   | 40 x 100 | -        | -        |
| 2200                                                                                                                                      | 40 x 100  | -        | -        | -        |

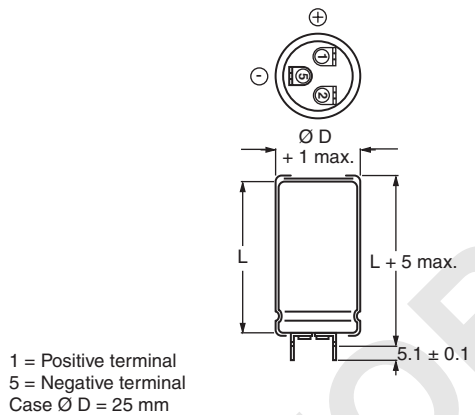
**DIMENSIONS in millimeters AND AVAILABLE FORMS**


Fig.1 Printed wiring pin version

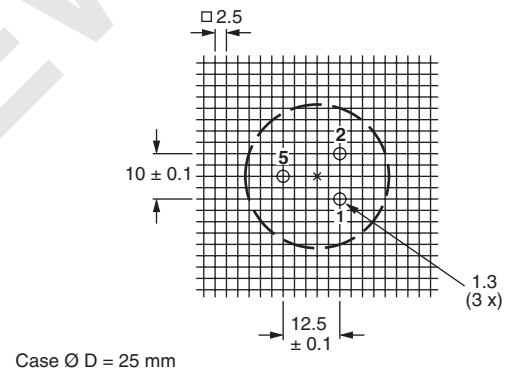


Fig.2 Mounting hole pattern viewed from the component side

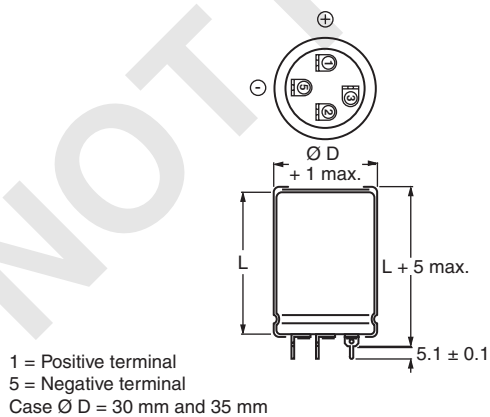


Fig.3 Printed wiring pin version

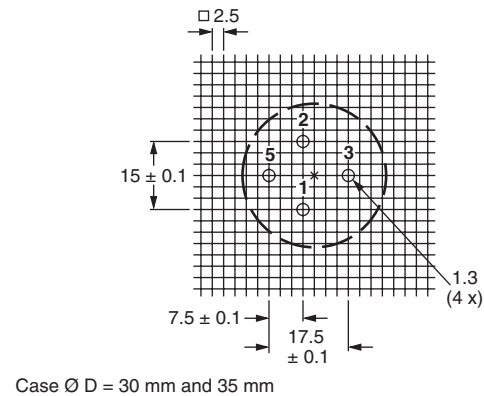
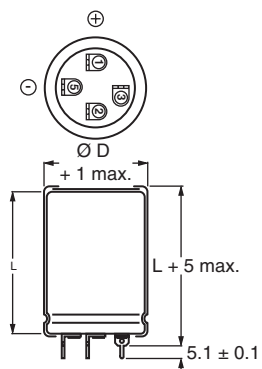
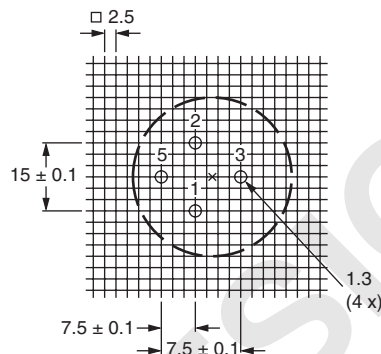


Fig.4 Mounting hole pattern viewed from the component side



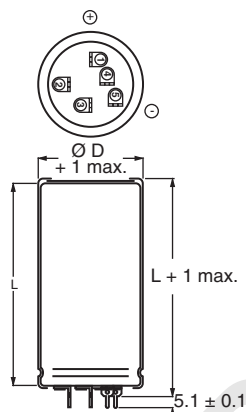
1 = Positive terminal;  
5 = Negative terminal  
Case Ø D = 35 mm

Fig.5 Printed wiring pin version



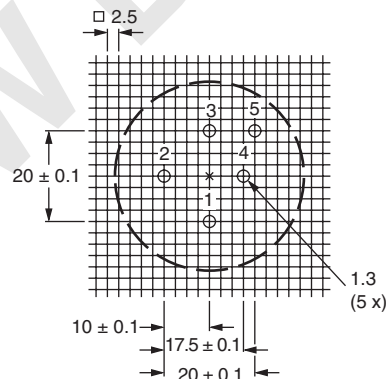
Case Ø D = 35 mm

Fig.6 Mounting hole pattern viewed from the component side



1 = Positive terminal;  
5 = Negative terminal  
Case Ø D = 40 mm

Fig.7 Printed wiring pin version



Case Ø D = 40 mm

Fig.8 Mounting hole pattern viewed from the component side

| DIMENSIONS in millimeters, MASS AND PACKAGING QUANTITIES PW versions |                     |                   |          |                                         |                                       |
|----------------------------------------------------------------------|---------------------|-------------------|----------|-----------------------------------------|---------------------------------------|
| NOMINAL CASE SIZE<br>Ø D x L                                         | Ø D <sub>max.</sub> | L <sub>max.</sub> | MASS (g) | PACKAGING QUANTITIES<br>(units per box) | CARDBOARD BOX DIMENSIONS<br>L x W x H |
| 25 x 30                                                              | 26                  | 35                | ≈ 24     | 100                                     | 290 x 280 x 50                        |
| 25 x 40                                                              | 26                  | 45                | ≈ 28     | 100                                     | 290 x 280 x 60                        |
| 30 x 40                                                              | 31                  | 45                | ≈ 38     | 100                                     | 340 x 330 x 60                        |
| 35 x 40                                                              | 36                  | 45                | ≈ 51     | 50                                      | 390 x 198 x 60                        |
| 35 x 50                                                              | 36                  | 55                | ≈ 66     | 50                                      | 390 x 198 x 70                        |
| 40 x 40                                                              | 41                  | 45                | ≈ 78     | 50                                      | 440 x 223 x 60                        |
| 40 x 50                                                              | 41                  | 55                | ≈ 82     | 50                                      | 440 x 223 x 70                        |
| 40 x 70                                                              | 41                  | 75                | ≈ 110    | 25                                      | 230 x 230 x 90                        |
| 40 x 100                                                             | 41                  | 105               | ≈ 176    | 25                                      | 230 x 230 x 120                       |

## MOUNTING

When a number of capacitors are connected in a bank, they must not be closer together than 15 mm, when no derating of ripple current and/or temperature is applied.

Pin numbers 2, 3 and 4 (if present) must be free from the electrical circuit.

| ELECTRICAL DATA |                                               |
|-----------------|-----------------------------------------------|
| SYMBOL          | DESCRIPTION                                   |
| $C_R$           | rated capacitance at 100 Hz                   |
| $I_R$           | rated RMS ripple current at 100 Hz and 105 °C |
| $I_{L1}$        | max. leakage current after 1 minute at $U_R$  |
| $I_{L5}$        | max. leakage current after 5 minutes at $U_R$ |
| ESR             | max. equivalent series resistance at 100 Hz   |
| Z               | max. impedance at 10 kHz                      |

**Note**

(1) Unless otherwise specified, all electrical values in Tables 2 and 3 apply at  $T_a = 20\text{ °C}$ ,  $P = 86\text{ kPa}$  to  $106\text{ kPa}$ ,  $RH = 45\%$  to  $75\%$

**ORDERING EXAMPLE**

10 000  $\mu\text{F}/25\text{ V}$ ;  $\pm 20\%$

Nominal case size:  $\varnothing 30 \times 40\text{ mm}$

Ordering code: MALPEYZ00BB510E02W

| ELECTRICAL DATA AND ORDERING INFORMATION |                                      |                                                          |                                  |                           |                           |                                |                              |                    |
|------------------------------------------|--------------------------------------|----------------------------------------------------------|----------------------------------|---------------------------|---------------------------|--------------------------------|------------------------------|--------------------|
| $U_R$<br>(V)                             | $C_R$<br>100 Hz<br>( $\mu\text{F}$ ) | NOMINAL<br>CASE SIZE<br>$\varnothing D \times L$<br>(mm) | $I_R$<br>100 Hz<br>105 °C<br>(A) | $I_{L1}$<br>1 min<br>(mA) | $I_{L5}$<br>5 min<br>(mA) | ESR<br>100 Hz<br>(m $\Omega$ ) | Z<br>10 kHz<br>(m $\Omega$ ) | ORDERING CODE      |
| 10                                       | 10 000                               | 25 x 30                                                  | 3.17                             | 0.60                      | 0.20                      | 48                             | 37                           | MALPEYZ00AV510C02W |
|                                          | 15 000                               | 25 x 40                                                  | 4.21                             | 0.90                      | 0.30                      | 34                             | 27                           | MALPEYZ00AB515C02W |
|                                          | 22 000                               | 30 x 40                                                  | 5.05                             | 1.32                      | 0.44                      | 29                             | 23                           | MALPEYZ00BB522C02W |
|                                          | 33 000                               | 35 x 40                                                  | 5.63                             | 1.98                      | 0.66                      | 27                             | 22                           | MALPEYZ00CB533C02W |
|                                          | 47 000                               | 35 x 50                                                  | 6.19                             | 2.82                      | 0.94                      | 26                             | 21                           | MALPEYZ00CD547C02W |
|                                          | 47 000                               | 40 x 40                                                  | 6.19                             | 2.82                      | 0.94                      | 26                             | 21                           | MALPEYZ00DB547C02W |
|                                          | 68 000                               | 40 x 50                                                  | 7.64                             | 4.08                      | 1.36                      | 21                             | 18                           | MALPEYZ00DD568C02W |
|                                          | 100 000                              | 40 x 70                                                  | 10.0                             | 6.00                      | 2.00                      | 16                             | 15                           | MALPEYZ00DG610C02W |
| 16                                       | 150 000                              | 40 x 100                                                 | 12.9                             | 9.00                      | 3.00                      | 13                             | 12                           | MALPEYZ00DM615C02W |
|                                          | 6800                                 | 25 x 30                                                  | 3.11                             | 0.65                      | 0.22                      | 50                             | 37                           | MALPEYZ00AV468D02W |
|                                          | 10 000                               | 25 x 40                                                  | 4.09                             | 0.96                      | 0.32                      | 36                             | 27                           | MALPEYZ00AB510D02W |
|                                          | 15 000                               | 30 x 40                                                  | 4.97                             | 1.44                      | 0.48                      | 30                             | 23                           | MALPEYZ00BB515D02W |
|                                          | 22 000                               | 35 x 40                                                  | 5.53                             | 2.12                      | 0.71                      | 29                             | 22                           | MALPEYZ00CB522D02W |
|                                          | 33 000                               | 35 x 50                                                  | 6.08                             | 3.17                      | 1.06                      | 28                             | 21                           | MALPEYZ00CD533D02W |
|                                          | 33 000                               | 40 x 40                                                  | 6.08                             | 3.17                      | 1.06                      | 28                             | 21                           | MALPEYZ00DB533D02W |
|                                          | 47 000                               | 40 x 50                                                  | 7.46                             | 4.52                      | 1.51                      | 22                             | 18                           | MALPEYZ00DD547D02W |
| 25                                       | 68 000                               | 40 x 70                                                  | 9.70                             | 6.53                      | 2.18                      | 17                             | 15                           | MALPEYZ00DG568D02W |
|                                          | 100 000                              | 40 x 100                                                 | 12.90                            | 9.60                      | 3.20                      | 13                             | 12                           | MALPEYZ00DM610D02W |
|                                          | 4700                                 | 25 x 30                                                  | 2.94                             | 0.71                      | 0.24                      | 56                             | 37                           | MALPEYZ00AV447E02W |
|                                          | 6800                                 | 25 x 40                                                  | 3.93                             | 1.02                      | 0.34                      | 39                             | 27                           | MALPEYZ00AB468E02W |
|                                          | 10 000                               | 30 x 40                                                  | 4.81                             | 1.50                      | 0.50                      | 32                             | 23                           | MALPEYZ00BB510E02W |
|                                          | 15 000                               | 35 x 40                                                  | 5.43                             | 2.25                      | 0.75                      | 30                             | 22                           | MALPEYZ00CB515E02W |
|                                          | 22 000                               | 35 x 50                                                  | 5.98                             | 3.30                      | 1.10                      | 29                             | 21                           | MALPEYZ00CD522E02W |
|                                          | 22 000                               | 40 x 40                                                  | 5.98                             | 3.30                      | 1.10                      | 29                             | 21                           | MALPEYZ00DB522E02W |
| 40                                       | 33 000                               | 40 x 50                                                  | 7.30                             | 4.95                      | 1.65                      | 23                             | 18                           | MALPEYZ00DD533E02W |
|                                          | 47 000                               | 40 x 70                                                  | 9.43                             | 7.05                      | 2.35                      | 18                             | 15                           | MALPEYZ00DG547E02W |
|                                          | 68 000                               | 40 x 100                                                 | 12.44                            | 10.20                     | 3.40                      | 14                             | 12                           | MALPEYZ00DM568E02W |
|                                          | 2200                                 | 25 x 30                                                  | 2.36                             | 0.53                      | 0.18                      | 87                             | 54                           | MALPEYZ00AV422G02W |
|                                          | 3300                                 | 25 x 40                                                  | 3.17                             | 0.79                      | 0.27                      | 60                             | 38                           | MALPEYZ00AB423G02W |
|                                          | 4700                                 | 30 x 40                                                  | 3.93                             | 1.13                      | 0.38                      | 48                             | 33                           | MALPEYZ00BB447G02W |
|                                          | 6800                                 | 35 x 40                                                  | 4.59                             | 1.63                      | 0.55                      | 42                             | 31                           | MALPEYZ00CB468G02W |
|                                          | 10 000                               | 35 x 50                                                  | 5.03                             | 2.40                      | 0.80                      | 41                             | 29                           | MALPEYZ00CD510G02W |
| 63                                       | 10 000                               | 40 x 40                                                  | 5.03                             | 2.40                      | 0.80                      | 41                             | 29                           | MALPEYZ00DB510G02W |
|                                          | 15 000                               | 40 x 50                                                  | 6.09                             | 3.60                      | 1.20                      | 33                             | 24                           | MALPEYZ00DD515G02W |
|                                          | 22 000                               | 40 x 70                                                  | 8.34                             | 5.28                      | 1.76                      | 23                             | 18                           | MALPEYZ00DG522G02W |
|                                          | 33 000                               | 40 x 100                                                 | 10.97                            | 7.92                      | 2.64                      | 18                             | 15                           | MALPEYZ00DM533G02W |
|                                          | 1000                                 | 25 x 30                                                  | 1.55                             | 0.38                      | 0.13                      | 202                            | 155                          | MALPEYZ00AV410J02W |
|                                          | 1500                                 | 25 x 40                                                  | 2.10                             | 0.57                      | 0.19                      | 137                            | 109                          | MALPEYZ00AB415J02W |
|                                          | 2200                                 | 30 x 40                                                  | 2.72                             | 0.83                      | 0.28                      | 100                            | 79                           | MALPEYZ00BB422J02W |
|                                          | 3300                                 | 35 x 40                                                  | 3.44                             | 1.25                      | 0.42                      | 75                             | 61                           | MALPEYZ00CB433J02W |
|                                          | 4700                                 | 35 x 50                                                  | 4.09                             | 1.78                      | 0.60                      | 62                             | 53                           | MALPEYZ00CD447J02W |
|                                          | 4700                                 | 40 x 40                                                  | 4.09                             | 1.78                      | 0.60                      | 62                             | 53                           | MALPEYZ00DB447J02W |
|                                          | 6800                                 | 40 x 50                                                  | 5.10                             | 2.57                      | 0.86                      | 47                             | 40                           | MALPEYZ00DD468J02W |
|                                          | 10 000                               | 40 x 70                                                  | 6.86                             | 3.78                      | 1.26                      | 34                             | 29                           | MALPEYZ00DG510J02W |
|                                          | 15 000                               | 40 x 100                                                 | 9.31                             | 5.67                      | 1.89                      | 25                             | 21                           | MALPEYZ00DM515J02W |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| $U_R$<br>(V) | $C_R$<br>100 Hz<br>( $\mu$ F) | NOMINAL<br>CASE SIZE<br>$\varnothing D \times L$<br>(mm) | $I_R$<br>100 Hz<br>105 °C<br>(A) | $I_{L1}$<br>1 min<br>(mA) | $I_{L5}$<br>5 min<br>(mA) | ESR<br>100 Hz<br>(m $\Omega$ ) | Z<br>10 kHz<br>(m $\Omega$ ) | ORDERING CODE      |
|--------------|-------------------------------|----------------------------------------------------------|----------------------------------|---------------------------|---------------------------|--------------------------------|------------------------------|--------------------|
| 100          | 470                           | 25 x 30                                                  | 1.42                             | 0.28                      | 0.10                      | 240                            | 155                          | MALPEYZ00AV347L02W |
|              | 680                           | 25 x 40                                                  | 1.90                             | 0.41                      | 0.14                      | 167                            | 109                          | MALPEYZ00AB368L02W |
|              | 1000                          | 30 x 40                                                  | 2.48                             | 0.60                      | 0.20                      | 120                            | 79                           | MALPEYZ00BB410L02W |
|              | 1500                          | 35 x 40                                                  | 3.17                             | 0.90                      | 0.30                      | 88                             | 61                           | MALPEYZ00CB415L02W |
|              | 2200                          | 35 x 50                                                  | 3.79                             | 1.32                      | 0.44                      | 72                             | 53                           | MALPEYZ00CD422L02W |
|              | 2200                          | 40 x 40                                                  | 3.79                             | 1.32                      | 0.44                      | 72                             | 53                           | MALPEYZ00DB422L02W |
|              | 3300                          | 40 x 50                                                  | 4.81                             | 1.98                      | 0.66                      | 53                             | 40                           | MALPEYZ00DD433L02W |
|              | 4700                          | 40 x 70                                                  | 6.49                             | 2.82                      | 0.94                      | 38                             | 29                           | MALPEYZ00DG447L02W |
|              | 6800                          | 40 x 100                                                 | 8.80                             | 4.08                      | 1.36                      | 28                             | 21                           | MALPEYZ00DM468L02W |
| 200          | 150                           | 25 x 30                                                  | 0.72                             | 0.18                      | 0.06                      | 950                            | 710                          | MALPEYZ00AV315S02W |
|              | 220                           | 25 x 40                                                  | 0.96                             | 0.26                      | 0.09                      | 650                            | 485                          | MALPEYZ00AB322S02W |
|              | 330                           | 30 x 40                                                  | 1.29                             | 0.40                      | 0.14                      | 442                            | 330                          | MALPEYZ00BB333S02W |
|              | 470                           | 35 x 40                                                  | 1.66                             | 0.57                      | 0.19                      | 321                            | 240                          | MALPEYZ00CB347S02W |
|              | 680                           | 35 x 50                                                  | 2.09                             | 0.82                      | 0.28                      | 237                            | 185                          | MALPEYZ00CD368S02W |
|              | 680                           | 40 x 40                                                  | 2.09                             | 0.82                      | 0.28                      | 237                            | 185                          | MALPEYZ00DB368S02W |
|              | 1000                          | 40 x 50                                                  | 2.71                             | 1.20                      | 0.40                      | 167                            | 133                          | MALPEYZ00DD410S02W |
|              | 1500                          | 40 x 70                                                  | 3.75                             | 1.80                      | 0.60                      | 114                            | 90                           | MALPEYZ00DG415S02W |
|              | 2200                          | 40 x 100                                                 | 5.24                             | 2.64                      | 0.88                      | 79                             | 62                           | MALPEYZ00DM422S02W |
| 250          | 100                           | 25 x 30                                                  | 0.67                             | 0.15                      | 0.05                      | 1060                           | 710                          | MALPEYZ00AV310N02W |
|              | 150                           | 25 x 40                                                  | 0.92                             | 0.22                      | 0.08                      | 710                            | 485                          | MALPEYZ00AB315N02W |
|              | 220                           | 30 x 40                                                  | 1.28                             | 0.33                      | 0.11                      | 492                            | 330                          | MALPEYZ00BB322N02W |
|              | 330                           | 35 x 40                                                  | 1.65                             | 0.49                      | 0.17                      | 325                            | 240                          | MALPEYZ00CB333N02W |
|              | 470                           | 35 x 50                                                  | 2.01                             | 0.70                      | 0.24                      | 256                            | 185                          | MALPEYZ00CD347N02W |
|              | 470                           | 40 x 40                                                  | 2.01                             | 0.70                      | 0.24                      | 256                            | 185                          | MALPEYZ00DB347N02W |
|              | 680                           | 40 x 50                                                  | 2.59                             | 1.02                      | 0.34                      | 182                            | 133                          | MALPEYZ00DD368N02W |
|              | 1000                          | 40 x 70                                                  | 3.58                             | 1.50                      | 0.50                      | 125                            | 90                           | MALPEYZ00DG410N02W |
|              | 1500                          | 40 x 100                                                 | 5.05                             | 2.25                      | 0.75                      | 85                             | 62                           | MALPEYZ00DM415N02W |
| 385          | 68                            | 25 x 30                                                  | 0.61                             | 0.16                      | 0.06                      | 1650                           | 1260                         | MALPEYZ00AV268R02W |
|              | 100                           | 25 x 40                                                  | 0.82                             | 0.23                      | 0.08                      | 1120                           | 855                          | MALPEYZ00AB310R02W |
|              | 150                           | 30 x 40                                                  | 1.10                             | 0.35                      | 0.12                      | 755                            | 580                          | MALPEYZ00BB315R02W |
|              | 220                           | 35 x 40                                                  | 1.44                             | 0.51                      | 0.17                      | 525                            | 405                          | MALPEYZ00CB322R02W |
|              | 330                           | 35 x 50                                                  | 1.84                             | 0.77                      | 0.26                      | 360                            | 280                          | MALPEYZ00CD333R02W |
|              | 330                           | 40 x 40                                                  | 1.84                             | 0.77                      | 0.26                      | 360                            | 280                          | MALPEYZ00DB333R02W |
|              | 470                           | 40 x 50                                                  | 2.37                             | 1.09                      | 0.36                      | 260                            | 205                          | MALPEYZ00DD347R02W |
|              | 680                           | 40 x 70                                                  | 3.24                             | 1.58                      | 0.53                      | 180                            | 140                          | MALPEYZ00DG368R02W |
|              | 1000                          | 40 x 100                                                 | 4.54                             | 2.31                      | 0.78                      | 125                            | 100                          | MALPEYZ00DM410R02W |
| 400          | 68                            | 25 x 30                                                  | 0.39                             | 0.16                      | 0.06                      | 3200                           | 2660                         | MALPEYZ00AV268X02W |
|              | 100                           | 25 x 40                                                  | 0.53                             | 0.24                      | 0.08                      | 2180                           | 1810                         | MALPEYZ00AB310X02W |
|              | 150                           | 30 x 40                                                  | 0.72                             | 0.36                      | 0.12                      | 1460                           | 1210                         | MALPEYZ00BB315X02W |
|              | 220                           | 35 x 40                                                  | 0.94                             | 0.52                      | 0.17                      | 1010                           | 830                          | MALPEYZ00CB322X02W |
|              | 330                           | 35 x 50                                                  | 1.24                             | 0.79                      | 0.26                      | 680                            | 570                          | MALPEYZ00CD333X02W |
|              | 330                           | 40 x 40                                                  | 1.24                             | 0.79                      | 0.26                      | 680                            | 570                          | MALPEYZ00DB333X02W |
|              | 470                           | 40 x 50                                                  | 1.59                             | 1.12                      | 0.37                      | 485                            | 407                          | MALPEYZ00DD347X02W |
|              | 680                           | 40 x 70                                                  | 2.18                             | 1.63                      | 0.54                      | 336                            | 282                          | MALPEYZ00DG368X02W |
|              | 1000                          | 40 x 100                                                 | 3.07                             | 2.40                      | 0.80                      | 230                            | 193                          | MALPEYZ00DM410X02W |

**ADDITIONAL ELECTRICAL DATA**

| PARAMETER                          | CONDITIONS                          | VALUE                                        |
|------------------------------------|-------------------------------------|----------------------------------------------|
| <b>Voltage</b>                     |                                     |                                              |
| Surge voltage                      | $\leq 200$ V versions               | $U_s = 1.15 \times U_R$                      |
|                                    | $\geq 385$ V versions               | $U_s = 1.1 \times U_R$                       |
| Reverse voltage                    |                                     | $U_{rev} \leq 1$ V                           |
| <b>Current</b>                     |                                     |                                              |
| Leakage current                    | After 1 minute at $U_R$             | $I_{L1} \leq 0.006 C_R \times U_R + 4 \mu A$ |
|                                    | After 5 minutes at $U_R$            | $I_{L5} \leq 0.002 C_R \times U_R + 4 \mu A$ |
| <b>Inductance</b>                  |                                     |                                              |
| Equivalent series inductance (ESL) | Case $\varnothing D = 25$ mm        | max. 25 nH                                   |
|                                    | Case $\varnothing D = 30$ and 35 mm | max. 30 nH                                   |
|                                    | Case $\varnothing D = 40$ mm        | max. 35 nH                                   |

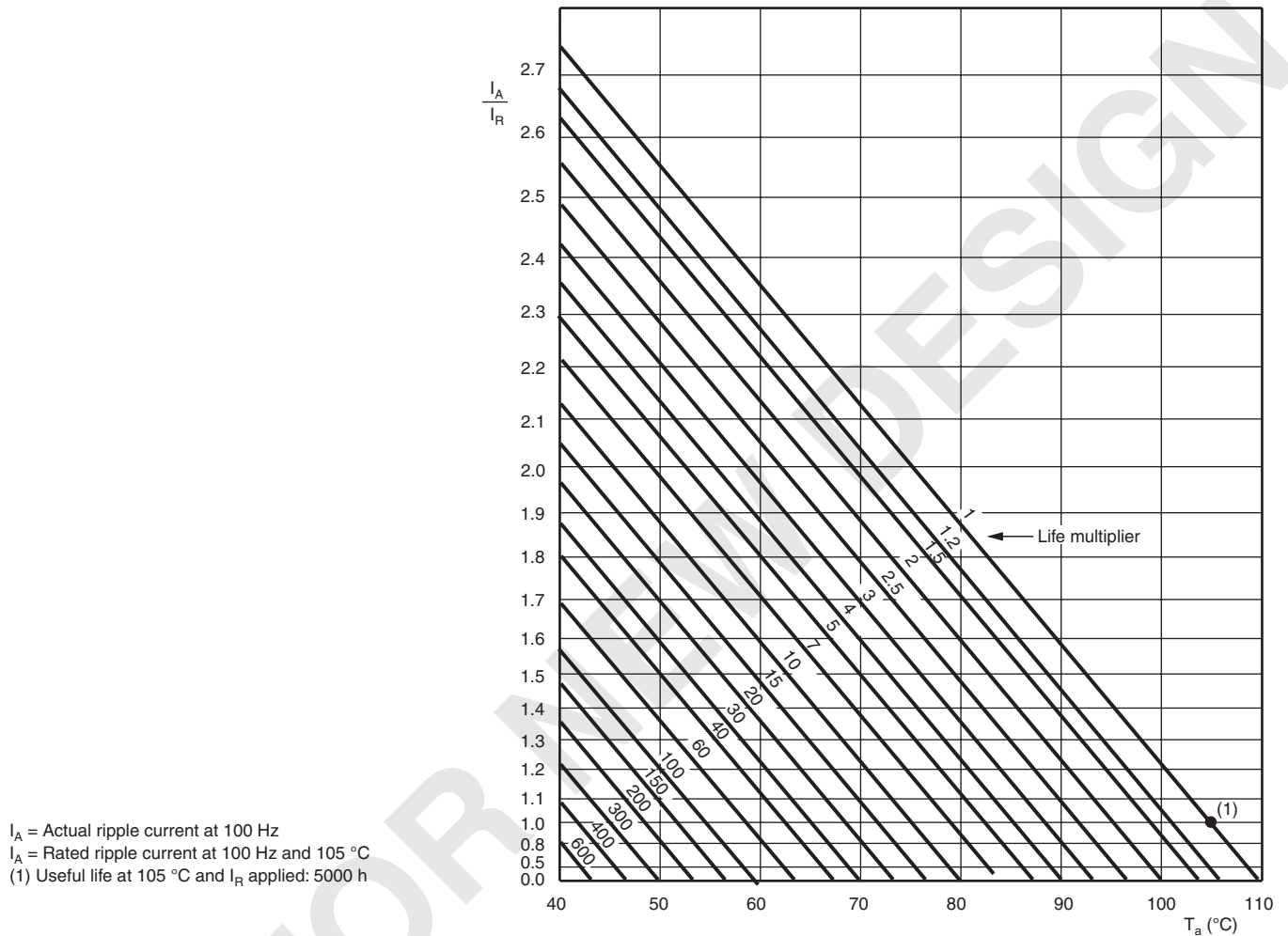
**RIPPLE CURRENT AND USEFUL LIFE**


Fig.9 Multiplier of useful life as a function of ambient temperature and ripple current load

| MULTIPLIER OF RIPPLE CURRENT ( $I_R$ ) AS A FUNCTION OF FREQUENCY |                                       |                                        |                                         |
|-------------------------------------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------|
| FREQUENCY<br>(Hz)                                                 | $I_R$ MULTIPLIER                      |                                        |                                         |
|                                                                   | $U_R = 10 \text{ V to } 25 \text{ V}$ | $U_R = 40 \text{ V to } 100 \text{ V}$ | $U_R = 200 \text{ V to } 400 \text{ V}$ |
| 50                                                                | 0.93                                  | 0.91                                   | 0.86                                    |
| 100                                                               | 1.00                                  | 1.00                                   | 1.00                                    |
| 200                                                               | 1.04                                  | 1.05                                   | 1.13                                    |
| 400                                                               | 1.07                                  | 1.09                                   | 1.21                                    |
| 1000                                                              | 1.11                                  | 1.13                                   | 1.29                                    |
| 2000                                                              | 1.13                                  | 1.15                                   | 1.32                                    |
| 4000                                                              | 1.15                                  | 1.18                                   | 1.35                                    |
| $\geq 10\,000$                                                    | 1.18                                  | 1.22                                   | 1.40                                    |

**TEST PROCEDURES AND REQUIREMENT**

| TEST                                           |                                            | PROCEDURE<br>(quick reference)                                                                                                                     | REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME OF TEST                                   | REFERENCE                                  |                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                 |
| Endurance                                      | IEC 60384-4/<br>EN130300<br>subclause 4.13 | $T_a = 105\text{ }^{\circ}\text{C}$ ; $U_R$ applied;<br>2000 h                                                                                     | $U_R \leq 100\text{ V}$ ; $\Delta C/C: \pm 15\%$<br>$U_R > 100\text{ V}$ ; $\Delta C/C: \pm 10\%$<br>$ESR \leq 1.3 \times \text{spec. limit}$<br>$Z \leq 2 \times \text{spec. limit}$<br>$I_{L5} \leq \text{spec. limit}$                                                                                                                                                       |
| Useful life                                    | CECC 30301<br>subclause 1.8.1              | $T_a = 105\text{ }^{\circ}\text{C}$ ; $U_R$ and $I_R$ applied; 5000 h                                                                              | $U_R \leq 100\text{ V}$ ; $\Delta C/C: \pm 45\%$<br>$U_R > 100\text{ V}$ ; $\Delta C/C: \pm 30\%$<br>$ESR \leq 3 \times \text{spec. limit}$<br>$Z \leq 3 \times \text{spec. limit}$<br>$I_{L5} \leq \text{spec. limit}$<br>no short or open circuit,<br>no visible damage<br>total failure percentage:<br>$U_R \leq 100\text{ V}: \leq 1\%$ ;<br>$U_R > 100\text{ V}: \leq 3\%$ |
| Shelf life<br>(storage at<br>high temperature) | IEC 60384-4/<br>EN130300<br>subclause 4.17 | $T_a = 105\text{ }^{\circ}\text{C}$ ; no voltage applied;<br>500 h<br>After test: $U_R$ to be applied for 30 min,<br>24 to 48 h before measurement | $\Delta C/C: \pm 10\%$<br>$ESR \leq 1.2 \times \text{spec. limit}$<br>$I_{L5} \leq 2 \times \text{spec. limit}$                                                                                                                                                                                                                                                                 |



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