

# **Aluminum electrolytic capacitors**

## **Snap-in capacitors**

**Series/Type:**        **B41231**

**Date:**                December 2019

## General-purpose grade capacitors

### Applications

- Professional power supplies
- Not for automotive applications unless otherwise specified

### Features

- High ripple current capability
- RoHS-compatible
- Useful life of 2000 h at 85 °C

### Construction

- Aluminum case, fully insulated with PET
- Version with PVC insulation available upon request
- Snap-in solder pins to hold component in place on PC-board
- Minus pole marking on the insulating sleeve
- Minus pole not insulated from case
- Overload protection by safety vent on the base

### Terminals

- Standard version with 2 terminals,  
2 lengths available: 6.0 and 4.5 mm
- 3 terminals to ensure correct insertion: length 4.5 mm





# Specifications and characteristics in brief

|                                                                        |                                                                                                                                                                                                                     |                                                                                                                        |      |      |      |      |              |      |      |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|------|------|------|--------------|------|------|
| Rated voltage V <sub>R</sub>                                           | 10 ... 100 V DC                                                                                                                                                                                                     |                                                                                                                        |      |      |      |      |              |      |      |
| Surge voltage V <sub>S</sub>                                           | 1.15 · V <sub>R</sub> (at room temperature)                                                                                                                                                                         |                                                                                                                        |      |      |      |      |              |      |      |
| Rated capacitance C <sub>R</sub>                                       | 1200 ... 68000 μF                                                                                                                                                                                                   |                                                                                                                        |      |      |      |      |              |      |      |
| Capacitance tolerance                                                  | ±20% △ M                                                                                                                                                                                                            |                                                                                                                        |      |      |      |      |              |      |      |
| Dissipation factor (max.)<br>(20 °C, 120 Hz)                           | V <sub>R</sub> (V DC)                                                                                                                                                                                               | 10                                                                                                                     | 16   | 25   | 35   | 50   | 63           | 80   | 100  |
|                                                                        | tan δ                                                                                                                                                                                                               | 0.50                                                                                                                   | 0.50 | 0.40 | 0.40 | 0.30 | 0.25         | 0.20 | 0.15 |
| Leakage current I <sub>leak</sub><br>(20 °C, after 5 minutes)          | $I_{leak} \leq 0.02 \mu A \cdot \left( \frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$                                                                                                                               |                                                                                                                        |      |      |      |      |              |      |      |
| Useful life <sup>1)</sup><br>85 °C; V <sub>R</sub> ; I <sub>AC,R</sub> | > 2000 h                                                                                                                                                                                                            | Requirements:                                                                                                          |      |      |      |      |              |      |      |
|                                                                        |                                                                                                                                                                                                                     | ΔC/C  ≤ 20% of initial value<br>tan δ ≤ 2 times initial specified limit<br>I <sub>leak</sub> ≤ initial specified limit |      |      |      |      |              |      |      |
| Vibration resistance test                                              | To IEC 60068-2-6, test Fc:<br>Frequency range 10 Hz ... 55 Hz, displacement amplitude 0.75 mm, acceleration max. 10 g, duration 3 × 2 h.<br>Capacitor rigidly clamped by the aluminum case.                         |                                                                                                                        |      |      |      |      |              |      |      |
| Shelf life                                                             | After storage for 1000 h at 85 °C, the capacitors shall meet the requirement of load life test after reforming process. After test: V <sub>R</sub> to be applied for 30 minutes, 24 to 48 hours before measurement. |                                                                                                                        |      |      |      |      |              |      |      |
| Characteristics at low temperature                                     | Max. impedance ratio at 120 Hz                                                                                                                                                                                      | V <sub>R</sub>                                                                                                         |      | 10 V |      |      | 16 ... 100 V |      |      |
|                                                                        |                                                                                                                                                                                                                     | Z <sub>-25 °C</sub> / Z <sub>20 °C</sub>                                                                               |      | 5    |      |      | 4            |      |      |
|                                                                        |                                                                                                                                                                                                                     | Z <sub>-40 °C</sub> / Z <sub>20 °C</sub>                                                                               |      | 18   |      |      | 15           |      |      |
| IEC climatic category                                                  | To IEC 60068-1:<br>25/085/56 (–25 °C/+85 °C/56 days damp heat test)<br>The capacitors can be operated in the temperature range of –40 °C to +85 °C but the impedance at –40 °C must be taken into consideration.    |                                                                                                                        |      |      |      |      |              |      |      |
| Sectional specification                                                | IEC 60384-4                                                                                                                                                                                                         |                                                                                                                        |      |      |      |      |              |      |      |

1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.

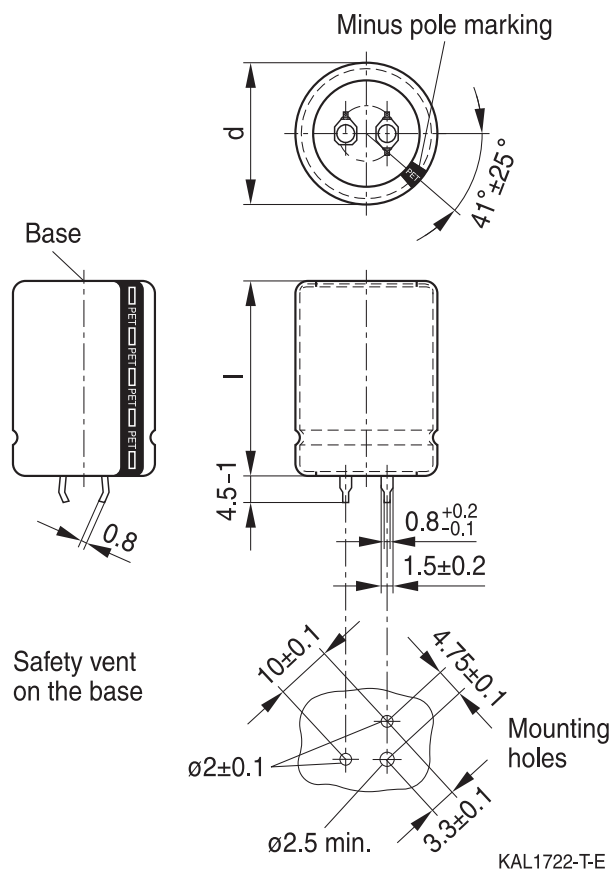
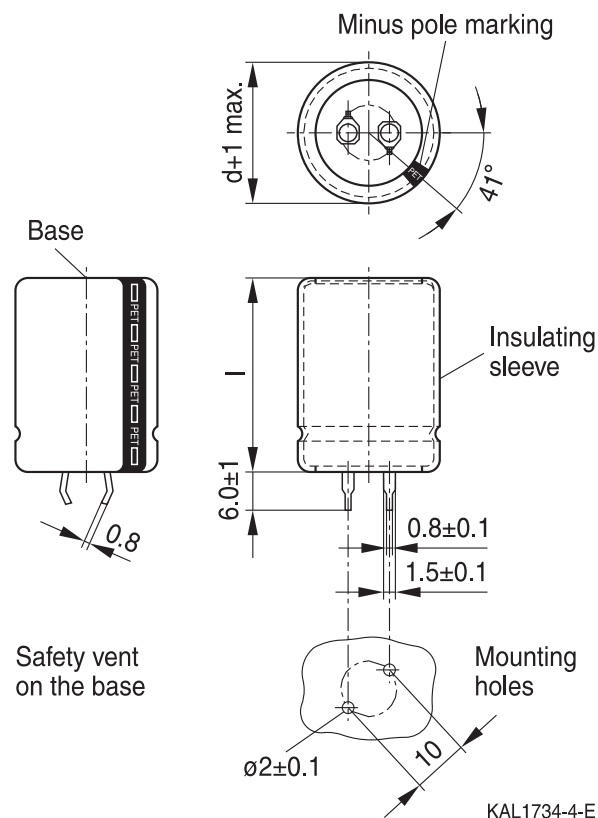


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85 °C

## Dimensional drawing

### Snap-in capacitors with standard insulation (PET)



Snap-in terminals, length (6.0 ± 1) mm.  
Also available in a shorter version with a length of (4.5 - 1) mm. Insulation is marked with "PET" on the sleeve. Safety vent on the base.

Snap-in capacitors are also available with 3 terminals (length (4.5 - 1) mm). Insulation is marked with "PET" on the sleeve. Safety vent on the base.

| Dimensions (mm) | Approx. weight (g) | Packing units (pcs.) |
|-----------------|--------------------|----------------------|
| d + 1           | l ± 2              |                      |
| 22              | 25                 | 13.0                 |
| 22              | 30                 | 15.0                 |
| 22              | 35                 | 20.5                 |
| 22              | 40                 | 23.0                 |
| 22              | 45                 | 25.0                 |
| 22              | 50                 | 29.5                 |
| 25.4            | 25                 | 13.5                 |
| 25.4            | 30                 | 19.5                 |
| 25.4            | 35                 | 25.0                 |
| 25.4            | 40                 | 28.0                 |
| 25.4            | 45                 | 31.0                 |
| 25.4            | 50                 | 39.0                 |

| Dimensions (mm) | Approx. weight (g) | Packing units (pcs.) |
|-----------------|--------------------|----------------------|
| d + 1           | l ± 2              |                      |
| 30              | 25                 | 24.5                 |
| 30              | 30                 | 25.5                 |
| 30              | 35                 | 32.5                 |
| 30              | 40                 | 39.0                 |
| 30              | 45                 | 43.5                 |
| 30              | 50                 | 55.5                 |
| 35              | 25                 | 35.0                 |
| 35              | 30                 | 43.0                 |
| 35              | 35                 | 50.5                 |
| 35              | 40                 | 52.0                 |
| 35              | 45                 | 65.0                 |
| 35              | 50                 | 70.5                 |

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## Ordering codes for terminal styles and insulation features

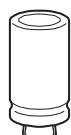
Identification in 3<sup>rd</sup> block of ordering code

Snap-in capacitors

| Terminal version          | Insulation |
|---------------------------|------------|
|                           | PET        |
| Standard terminals 6.0 mm | M060       |
| Short terminals 4.5 mm    | M067       |
| 3 terminals 4.5 mm        | M062       |

Ordering examples:

B41231A9478M067 } snap-in capacitor with short terminals and PET insulation  
 B41231A9478M062 } snap-in capacitor with 3 terminals and PET insulation



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# Overview of available types

| V <sub>R</sub> (V DC) | 10                         | 16 | 25                   | 35                              | 50                                         | 63                                         | 80                              | 100                             |
|-----------------------|----------------------------|----|----------------------|---------------------------------|--------------------------------------------|--------------------------------------------|---------------------------------|---------------------------------|
|                       | Case dimensions d × l (mm) |    |                      |                                 |                                            |                                            |                                 |                                 |
| C <sub>R</sub> (μF)   |                            |    |                      |                                 |                                            |                                            |                                 |                                 |
| 1200                  |                            |    |                      |                                 |                                            |                                            | 22 × 25                         | 22 × 30<br>25.4 × 25            |
| 1500                  |                            |    |                      |                                 |                                            |                                            | 22 × 30                         | 22 × 35<br>25.4 × 30<br>30 × 25 |
| 1800                  |                            |    |                      |                                 |                                            | 22 × 25                                    | 22 × 30<br>25.4 × 25            | 22 × 40<br>25.4 × 35<br>30 × 30 |
| 2200                  |                            |    |                      |                                 |                                            | 22 × 30<br>25.4 × 25                       | 22 × 35<br>25.4 × 30<br>30 × 25 | 22 × 45<br>25.4 × 40<br>30 × 30 |
| 2700                  |                            |    |                      |                                 |                                            | 22 × 35<br>25.4 × 30                       | 22 × 40<br>25.4 × 35<br>30 × 30 | 25.4 × 45<br>30 × 35<br>35 × 30 |
| 3300                  |                            |    |                      |                                 | 22 × 30<br>25.4 × 25                       | 22 × 35<br>25.4 × 30<br>30 × 25            | 22 × 45<br>25.4 × 40<br>30 × 30 | 25.4 × 50<br>30 × 40<br>35 × 35 |
| 3900                  |                            |    |                      |                                 |                                            | 22 × 40<br>25.4 × 35<br>30 × 30            | 22 × 50<br>25.4 × 45<br>30 × 35 | 30 × 45<br>35 × 35              |
| 4700                  |                            |    |                      | 22 × 30<br>25.4 × 25            | 22 × 40<br>25.4 × 35<br>30 × 25<br>35 × 25 | 22 × 50<br>25.4 × 40<br>30 × 35<br>35 × 30 | 25.4 × 50<br>30 × 40<br>35 × 30 | 30 × 50<br>35 × 40              |
| 5600                  |                            |    | 22 × 25              | 22 × 35<br>25.4 × 30            | 22 × 45<br>25.4 × 40<br>30 × 30<br>35 × 25 | 25.4 × 45<br>30 × 35<br>35 × 30            | 30 × 45<br>35 × 35              | 35 × 45                         |
| 6800                  |                            |    | 22 × 30<br>25.4 × 25 | 22 × 40<br>25.4 × 30<br>30 × 25 | 22 × 50<br>25.4 × 45<br>30 × 35<br>35 × 30 | 25.4 × 50<br>30 × 40<br>35 × 30            | 35 × 40                         |                                 |
| 8200                  |                            |    | 22 × 35<br>25.4 × 30 | 22 × 45<br>25.4 × 35<br>30 × 30 | 25.4 × 50<br>30 × 40<br>35 × 30            | 30 × 45<br>35 × 35                         | 35 × 45                         |                                 |



# Overview of available types

| V <sub>R</sub> (V DC)      | 10                                         | 16                              | 25                              | 35                              | 50                 | 63                 | 80 | 100 |
|----------------------------|--------------------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------|--------------------|----|-----|
| Case dimensions d × l (mm) |                                            |                                 |                                 |                                 |                    |                    |    |     |
| C <sub>R</sub> (μF)        |                                            |                                 |                                 |                                 |                    |                    |    |     |
| 10000                      |                                            | 22 × 25                         | 22 × 40<br>25.4 × 30            | 22 × 50<br>25.4 × 40<br>30 × 30 | 30 × 45<br>35 × 35 | 30 × 50<br>35 × 40 |    |     |
| 12000                      | 22 × 25                                    | 22 × 30<br>25.4 × 25            | 22 × 45<br>25.4 × 35<br>30 × 25 | 25.4 × 45<br>30 × 35<br>35 × 30 | 30 × 50<br>35 × 40 | 35 × 45            |    |     |
| 15000                      | 22 × 30<br>25.4 × 25                       | 22 × 35<br>25.4 × 30<br>30 × 25 | 22 × 50<br>25.4 × 40<br>30 × 30 | 30 × 40<br>35 × 35              | 35 × 45            |                    |    |     |
| 18000                      | 22 × 35<br>25.4 × 25                       | 22 × 40<br>25.4 × 35<br>30 × 30 | 25.4 × 45<br>30 × 35            | 30 × 45<br>35 × 40              | 35 × 50            |                    |    |     |
| 22000                      | 22 × 40<br>25.4 × 30<br>30 × 25            | 22 × 50<br>25.4 × 40<br>30 × 30 | 30 × 35<br>35 × 30              | 35 × 45                         |                    |                    |    |     |
| 27000                      | 22 × 45<br>25.4 × 35<br>30 × 30            | 25.4 × 45<br>30 × 35<br>35 × 25 | 30 × 45<br>35 × 35              |                                 |                    |                    |    |     |
| 33000                      | 22 × 50<br>25.4 × 40<br>30 × 30<br>35 × 25 | 30 × 40<br>35 × 30              | 30 × 50<br>35 × 40              |                                 |                    |                    |    |     |
| 39000                      | 25.4 × 45<br>30 × 35<br>35 × 30            | 30 × 45<br>35 × 35              | 35 × 45                         |                                 |                    |                    |    |     |
| 47000                      | 25.4 × 50<br>30 × 40<br>35 × 30            | 30 × 50<br>35 × 40              |                                 |                                 |                    |                    |    |     |
| 56000                      | 30 × 45<br>35 × 35                         | 35 × 45                         |                                 |                                 |                    |                    |    |     |
| 68000                      | 35 × 40                                    | 35 × 50                         |                                 |                                 |                    |                    |    |     |


**B41231**
**85 °C**

# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>μF | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|--------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 10 \text{ V DC}$        |                                          |                                         |                                       |                                    |                                          |
| 12000                          | 22 × 25                                  | 0.50                                    | 6.55                                  | 3.31                               | B41231A3129M06#                          |
| 15000                          | 22 × 30                                  | 0.50                                    | 7.56                                  | 3.82                               | B41231A3159M06#                          |
| 15000                          | 25.4 × 25                                | 0.50                                    | 6.71                                  | 3.39                               | B41231B3159M06#                          |
| 18000                          | 22 × 35                                  | 0.50                                    | 8.47                                  | 4.28                               | B41231A3189M06#                          |
| 18000                          | 25.4 × 25                                | 0.50                                    | 8.26                                  | 4.17                               | B41231B3189M06#                          |
| 22000                          | 22 × 40                                  | 0.50                                    | 9.48                                  | 4.79                               | B41231A3229M06#                          |
| 22000                          | 25.4 × 30                                | 0.50                                    | 9.33                                  | 4.71                               | B41231B3229M06#                          |
| 22000                          | 30 × 25                                  | 0.50                                    | 9.56                                  | 4.83                               | B41231C3229M06#                          |
| 27000                          | 22 × 45                                  | 0.50                                    | 10.5                                  | 5.30                               | B41231A3279M06#                          |
| 27000                          | 25.4 × 35                                | 0.50                                    | 10.4                                  | 5.26                               | B41231B3279M06#                          |
| 27000                          | 30 × 30                                  | 0.50                                    | 11.7                                  | 5.41                               | B41231C3279M06#                          |
| 33000                          | 22 × 50                                  | 0.50                                    | 11.5                                  | 5.82                               | B41231A3339M06#                          |
| 33000                          | 25.4 × 40                                | 0.50                                    | 11.5                                  | 5.81                               | B41231B3339M06#                          |
| 33000                          | 30 × 30                                  | 0.50                                    | 11.2                                  | 5.69                               | B41231C3339M06#                          |
| 33000                          | 35 × 25                                  | 0.50                                    | 11.5                                  | 5.81                               | B41231D3339M06#                          |
| 39000                          | 25.4 × 45                                | 0.50                                    | 12.5                                  | 6.31                               | B41231A3399M06#                          |
| 39000                          | 30 × 35                                  | 0.50                                    | 12.3                                  | 6.22                               | B41231B3399M06#                          |
| 39000                          | 35 × 30                                  | 0.50                                    | 12.6                                  | 6.38                               | B41231C3399M06#                          |
| 47000                          | 25.4 × 50                                | 0.50                                    | 13.5                                  | 6.83                               | B41231A3479M06#                          |
| 47000                          | 30 × 40                                  | 0.50                                    | 13.4                                  | 6.78                               | B41231B3479M06#                          |
| 47000                          | 35 × 30                                  | 0.50                                    | 13.1                                  | 6.62                               | B41231C3479M06#                          |
| 56000                          | 30 × 45                                  | 0.50                                    | 14.4                                  | 7.31                               | B41231A3569M06#                          |
| 56000                          | 35 × 35                                  | 0.50                                    | 14.2                                  | 7.18                               | B41231B3569M06#                          |
| 68000                          | 35 × 40                                  | 0.50                                    | 15.3                                  | 7.76                               | B41231A3689M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

B41231

85 °C



# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 16 \text{ V DC}$             |                                          |                                         |                                       |                                    |                                          |
| 10000                               | 22 × 25                                  | 0.50                                    | 6.57                                  | 3.32                               | B41231A4109M06#                          |
| 12000                               | 22 × 30                                  | 0.50                                    | 7.03                                  | 3.55                               | B41231A4129M06#                          |
| 12000                               | 25.4 × 25                                | 0.50                                    | 7.70                                  | 3.89                               | B41231B4129M06#                          |
| 15000                               | 22 × 35                                  | 0.50                                    | 8.49                                  | 4.29                               | B41231A4159M06#                          |
| 15000                               | 25.4 × 30                                | 0.50                                    | 8.81                                  | 4.45                               | B41231B4159M06#                          |
| 15000                               | 30 × 25                                  | 0.50                                    | 9.03                                  | 4.56                               | B41231C4159M06#                          |
| 18000                               | 22 × 40                                  | 0.50                                    | 9.44                                  | 4.77                               | B41231A4189M06#                          |
| 18000                               | 25.4 × 35                                | 0.50                                    | 9.82                                  | 4.96                               | B41231B4189M06#                          |
| 18000                               | 30 × 30                                  | 0.50                                    | 10.1                                  | 5.10                               | B41231C4189M06#                          |
| 22000                               | 22 × 50                                  | 0.50                                    | 10.9                                  | 5.51                               | B41231A4229M06#                          |
| 22000                               | 25.4 × 40                                | 0.50                                    | 10.9                                  | 5.51                               | B41231B4229M06#                          |
| 22000                               | 30 × 30                                  | 0.50                                    | 10.6                                  | 5.39                               | B41231C4229M06#                          |
| 27000                               | 25.4 × 45                                | 0.50                                    | 12.0                                  | 6.06                               | B41231A4279M06#                          |
| 27000                               | 30 × 35                                  | 0.50                                    | 11.8                                  | 5.98                               | B41231B4279M06#                          |
| 27000                               | 35 × 25                                  | 0.50                                    | 11.5                                  | 5.80                               | B41231C4279M06#                          |
| 33000                               | 30 × 40                                  | 0.50                                    | 13.0                                  | 6.56                               | B41231A4339M06#                          |
| 33000                               | 35 × 30                                  | 0.50                                    | 12.7                                  | 6.41                               | B41231B4339M06#                          |
| 39000                               | 30 × 45                                  | 0.50                                    | 14.0                                  | 7.08                               | B41231A4399M06#                          |
| 39000                               | 35 × 35                                  | 0.50                                    | 13.8                                  | 6.96                               | B41231B4399M06#                          |
| 47000                               | 30 × 50                                  | 0.50                                    | 15.1                                  | 7.62                               | B41231A4479M06#                          |
| 47000                               | 35 × 40                                  | 0.50                                    | 14.9                                  | 7.54                               | B41231B4479M06#                          |
| 56000                               | 35 × 45                                  | 0.50                                    | 16.0                                  | 8.08                               | B41231A4569M06#                          |
| 68000                               | 35 × 50                                  | 0.50                                    | 16.9                                  | 8.53                               | B41231A4689M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)


**B41231**
**85 °C**

# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 25 \text{ V DC}$             |                                          |                                         |                                       |                                    |                                          |
| 5600                                | 22 × 25                                  | 0.40                                    | 5.25                                  | 2.65                               | B41231A5568M06#                          |
| 6800                                | 22 × 30                                  | 0.40                                    | 6.06                                  | 3.06                               | B41231A5688M06#                          |
| 6800                                | 25.4 × 25                                | 0.40                                    | 6.24                                  | 3.15                               | B41231B5688M06#                          |
| 8200                                | 22 × 35                                  | 0.40                                    | 6.83                                  | 3.45                               | B41231A5828M06#                          |
| 8200                                | 25.4 × 30                                | 0.40                                    | 7.07                                  | 3.57                               | B41231B5828M06#                          |
| 10000                               | 22 × 40                                  | 0.40                                    | 7.82                                  | 3.95                               | B41231A5109M06#                          |
| 10000                               | 25.4 × 30                                | 0.40                                    | 7.70                                  | 3.89                               | B41231B5109M06#                          |
| 12000                               | 22 × 45                                  | 0.40                                    | 8.73                                  | 4.41                               | B41231A5129M06#                          |
| 12000                               | 25.4 × 35                                | 0.40                                    | 8.65                                  | 4.37                               | B41231B5129M06#                          |
| 12000                               | 30 × 25                                  | 0.40                                    | 7.90                                  | 3.99                               | B41231C5129M06#                          |
| 15000                               | 22 × 50                                  | 0.40                                    | 9.78                                  | 4.94                               | B41231A5159M06#                          |
| 15000                               | 25.4 × 40                                | 0.40                                    | 9.78                                  | 4.94                               | B41231B5159M06#                          |
| 15000                               | 30 × 30                                  | 0.40                                    | 8.91                                  | 4.50                               | B41231C5159M06#                          |
| 18000                               | 25.4 × 45                                | 0.40                                    | 10.8                                  | 5.45                               | B41231A5189M06#                          |
| 18000                               | 30 × 35                                  | 0.40                                    | 10.1                                  | 5.10                               | B41231B5189M06#                          |
| 22000                               | 30 × 35                                  | 0.40                                    | 10.6                                  | 5.38                               | B41231A5229M06#                          |
| 22000                               | 35 × 30                                  | 0.40                                    | 10.9                                  | 5.51                               | B41231B5229M06#                          |
| 27000                               | 30 × 45                                  | 0.40                                    | 12.3                                  | 6.22                               | B41231A5279M06#                          |
| 27000                               | 35 × 35                                  | 0.40                                    | 12.1                                  | 6.12                               | B41231B5279M06#                          |
| 33000                               | 30 × 50                                  | 0.40                                    | 13.5                                  | 6.82                               | B41231A5339M06#                          |
| 33000                               | 35 × 40                                  | 0.40                                    | 13.3                                  | 6.74                               | B41231B5339M06#                          |
| 39000                               | 35 × 45                                  | 0.40                                    | 14.5                                  | 7.35                               | B41231A5399M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

B41231

85 °C



# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 35 \text{ V DC}$             |                                          |                                         |                                       |                                    |                                          |
| 4700                                | 22 × 30                                  | 0.40                                    | 6.06                                  | 3.06                               | B41231A7478M06#                          |
| 4700                                | 25.4 × 25                                | 0.40                                    | 5.90                                  | 2.98                               | B41231B7478M06#                          |
| 5600                                | 22 × 35                                  | 0.40                                    | 6.49                                  | 3.28                               | B41231A7568M06#                          |
| 5600                                | 25.4 × 30                                | 0.40                                    | 6.71                                  | 3.39                               | B41231B7568M06#                          |
| 6800                                | 22 × 40                                  | 0.40                                    | 7.39                                  | 3.73                               | B41231A7688M06#                          |
| 6800                                | 25.4 × 30                                | 0.40                                    | 7.27                                  | 3.67                               | B41231B7688M06#                          |
| 6800                                | 30 × 25                                  | 0.40                                    | 7.44                                  | 3.76                               | B41231C7688M06#                          |
| 8200                                | 22 × 45                                  | 0.40                                    | 8.18                                  | 4.13                               | B41231A7828M06#                          |
| 8200                                | 25.4 × 35                                | 0.40                                    | 8.12                                  | 4.10                               | B41231B7828M06#                          |
| 8200                                | 30 × 30                                  | 0.40                                    | 8.36                                  | 4.22                               | B41231C7828M06#                          |
| 10000                               | 22 × 50                                  | 0.40                                    | 9.27                                  | 4.68                               | B41231A7109M06#                          |
| 10000                               | 25.4 × 40                                | 0.40                                    | 9.27                                  | 4.68                               | B41231B7109M06#                          |
| 10000                               | 30 × 30                                  | 0.40                                    | 9.07                                  | 4.58                               | B41231C7109M06#                          |
| 12000                               | 25.4 × 45                                | 0.40                                    | 10.2                                  | 5.18                               | B41231A7129M06#                          |
| 12000                               | 30 × 35                                  | 0.40                                    | 10.1                                  | 5.11                               | B41231C7129M06#                          |
| 12000                               | 35 × 30                                  | 0.40                                    | 10.4                                  | 5.24                               | B41231D7129M06#                          |
| 15000                               | 30 × 40                                  | 0.40                                    | 11.3                                  | 5.72                               | B41231A7159M06#                          |
| 15000                               | 35 × 35                                  | 0.40                                    | 11.6                                  | 5.88                               | B41231B7159M06#                          |
| 18000                               | 30 × 45                                  | 0.40                                    | 12.4                                  | 6.28                               | B41231A7189M06#                          |
| 18000                               | 35 × 40                                  | 0.40                                    | 12.8                                  | 6.46                               | B41231B7189M06#                          |
| 22000                               | 35 × 45                                  | 0.40                                    | 14.0                                  | 7.07                               | B41231A7229M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)


**B41231**
**85 °C**

# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 50 \text{ V DC}$             |                                          |                                         |                                       |                                    |                                          |
| 3300                                | 22 × 30                                  | 0.30                                    | 5.88                                  | 2.97                               | B41231A6338M06#                          |
| 3300                                | 25.4 × 25                                | 0.30                                    | 7.58                                  | 3.06                               | B41231B6338M06#                          |
| 4700                                | 22 × 40                                  | 0.30                                    | 7.58                                  | 3.83                               | B41231A6478M06#                          |
| 4700                                | 25.4 × 35                                | 0.30                                    | 7.88                                  | 3.98                               | B41231B6478M06#                          |
| 4700                                | 30 × 25                                  | 0.30                                    | 7.64                                  | 3.86                               | B41231C6478M06#                          |
| 4700                                | 35 × 25                                  | 0.30                                    | 8.30                                  | 4.19                               | B41231D6478M06#                          |
| 5600                                | 22 × 45                                  | 0.30                                    | 8.43                                  | 4.26                               | B41231A6568M06#                          |
| 5600                                | 25.4 × 40                                | 0.30                                    | 8.79                                  | 4.44                               | B41231B6568M06#                          |
| 5600                                | 30 × 30                                  | 0.30                                    | 8.61                                  | 4.35                               | B41231C6568M06#                          |
| 5600                                | 35 × 25                                  | 0.30                                    | 8.79                                  | 4.44                               | B41231D6568M06#                          |
| 6800                                | 22 × 50                                  | 0.30                                    | 9.44                                  | 4.77                               | B41231A6688M06#                          |
| 6800                                | 25.4 × 45                                | 0.30                                    | 9.42                                  | 4.76                               | B41231B6688M06#                          |
| 6800                                | 30 × 35                                  | 0.30                                    | 9.74                                  | 4.92                               | B41231C6688M06#                          |
| 6800                                | 35 × 30                                  | 0.30                                    | 9.98                                  | 5.04                               | B41231D6688M06#                          |
| 8200                                | 25.4 × 50                                | 0.30                                    | 10.7                                  | 5.43                               | B41231A6828M06#                          |
| 8200                                | 30 × 40                                  | 0.30                                    | 10.6                                  | 5.38                               | B41231B6828M06#                          |
| 8200                                | 35 × 30                                  | 0.30                                    | 10.4                                  | 5.26                               | B41231C6828M06#                          |
| 10000                               | 30 × 45                                  | 0.30                                    | 12.0                                  | 6.07                               | B41231A6109M06#                          |
| 10000                               | 35 × 35                                  | 0.30                                    | 11.8                                  | 5.97                               | B41231B6109M06#                          |
| 12000                               | 30 × 50                                  | 0.30                                    | 13.1                                  | 6.62                               | B41231A6129M06#                          |
| 12000                               | 35 × 40                                  | 0.30                                    | 12.9                                  | 6.55                               | B41231B6129M06#                          |
| 15000                               | 35 × 45                                  | 0.30                                    | 14.2                                  | 7.20                               | B41231A6159M06#                          |
| 18000                               | 35 × 50                                  | 0.30                                    | 15.3                                  | 7.74                               | B41231A6189M06#                          |

# Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

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85 °C



# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{max}$<br>120 Hz<br>20 °C | $I_{AC,max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|----------------------------------------|--------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 63 V DC$                     |                                          |                                        |                                      |                                    |                                          |
| 1800                                | 22 × 25                                  | 0.25                                   | 4.36                                 | 2.20                               | B41231A8188M06#                          |
| 2200                                | 22 × 30                                  | 0.25                                   | 4.95                                 | 2.50                               | B41231A8228M06#                          |
| 2200                                | 25.4 × 25                                | 0.25                                   | 5.11                                 | 2.58                               | B41231B8228M06#                          |
| 2700                                | 22 × 35                                  | 0.25                                   | 5.82                                 | 2.94                               | B41231A8278M06#                          |
| 2700                                | 25.4 × 30                                | 0.25                                   | 6.02                                 | 3.04                               | B41231B8278M06#                          |
| 3300                                | 22 × 35                                  | 0.25                                   | 6.22                                 | 3.14                               | B41231A8338M06#                          |
| 3300                                | 25.4 × 30                                | 0.25                                   | 6.45                                 | 3.26                               | B41231B8338M06#                          |
| 3300                                | 30 × 25                                  | 0.25                                   | 6.61                                 | 3.34                               | B41231C8338M06#                          |
| 3900                                | 22 × 40                                  | 0.25                                   | 7.13                                 | 3.60                               | B41231A8398M06#                          |
| 3900                                | 25.4 × 35                                | 0.25                                   | 7.41                                 | 3.74                               | B41231B8398M06#                          |
| 3900                                | 30 × 30                                  | 0.25                                   | 7.62                                 | 3.85                               | B41231C8398M06#                          |
| 4700                                | 22 × 50                                  | 0.25                                   | 8.30                                 | 4.19                               | B41231A8478M06#                          |
| 4700                                | 25.4 × 40                                | 0.25                                   | 8.30                                 | 4.19                               | B41231B8478M06#                          |
| 4700                                | 30 × 35                                  | 0.25                                   | 8.12                                 | 4.10                               | B41231C8478M06#                          |
| 4700                                | 35 × 30                                  | 0.25                                   | 8.30                                 | 4.19                               | B41231D8478M06#                          |
| 5600                                | 25.4 × 45                                | 0.25                                   | 9.21                                 | 4.65                               | B41231A8568M06#                          |
| 5600                                | 30 × 35                                  | 0.25                                   | 9.07                                 | 4.58                               | B41231B8568M06#                          |
| 5600                                | 35 × 30                                  | 0.25                                   | 9.31                                 | 4.70                               | B41231C8568M06#                          |
| 6800                                | 25.4 × 50                                | 0.25                                   | 10.3                                 | 5.20                               | B41231A8688M06#                          |
| 6800                                | 30 × 40                                  | 0.25                                   | 10.2                                 | 5.16                               | B41231B8688M06#                          |
| 6800                                | 35 × 30                                  | 0.25                                   | 9.98                                 | 5.04                               | B41231C8688M06#                          |
| 8200                                | 30 × 45                                  | 0.25                                   | 11.1                                 | 5.62                               | B41231A8828M06#                          |
| 8200                                | 35 × 35                                  | 0.25                                   | 10.9                                 | 5.53                               | B41231B8828M06#                          |
| 10000                               | 30 × 50                                  | 0.25                                   | 12.5                                 | 6.32                               | B41231A8109M06#                          |
| 10000                               | 35 × 40                                  | 0.25                                   | 12.4                                 | 6.25                               | B41231B8109M06#                          |
| 12000                               | 35 × 45                                  | 0.25                                   | 13.5                                 | 6.83                               | B41231A8129M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)


**B41231**
**85 °C**

# **Technical data and ordering codes**

| $C_R$<br>120 Hz<br>20 °C<br>μF            | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| <b><math>V_R = 80 \text{ V DC}</math></b> |                                          |                                         |                                       |                                    |                                          |
| 1200                                      | 22 × 25                                  | 0.20                                    | 4.44                                  | 2.24                               | B41231A0128M06#                          |
| 1500                                      | 22 × 30                                  | 0.20                                    | 5.29                                  | 2.67                               | B41231A0158M06#                          |
| 1800                                      | 22 × 30                                  | 0.20                                    | 5.78                                  | 2.92                               | B41231A0188M06#                          |
| 1800                                      | 25.4 × 25                                | 0.20                                    | 5.96                                  | 3.01                               | B41231B0188M06#                          |
| 2200                                      | 22 × 35                                  | 0.25                                    | 6.44                                  | 3.25                               | B41231A0228M06#                          |
| 2200                                      | 25.4 × 30                                | 0.20                                    | 6.65                                  | 3.36                               | B41231B0228M06#                          |
| 2200                                      | 30 × 25                                  | 0.20                                    | 6.83                                  | 3.45                               | B41231C0228M06#                          |
| 2700                                      | 22 × 40                                  | 0.20                                    | 7.50                                  | 3.79                               | B41231A0278M06#                          |
| 2700                                      | 25.4 × 35                                | 0.20                                    | 7.80                                  | 3.94                               | B41231B0278M06#                          |
| 2700                                      | 30 × 30                                  | 0.20                                    | 8.02                                  | 4.05                               | B41231C0278M06#                          |
| 3300                                      | 22 × 45                                  | 0.20                                    | 8.28                                  | 4.18                               | B41231A0338M06#                          |
| 3300                                      | 25.4 × 40                                | 0.20                                    | 8.63                                  | 4.36                               | B41231B0338M06#                          |
| 3300                                      | 30 × 30                                  | 0.20                                    | 8.45                                  | 4.27                               | B41231C0338M06#                          |
| 3900                                      | 22 × 50                                  | 0.25                                    | 9.41                                  | 4.75                               | B41231A0398M06#                          |
| 3900                                      | 25.4 × 45                                | 0.20                                    | 9.82                                  | 4.96                               | B41231B0398M06#                          |
| 3900                                      | 30 × 35                                  | 0.20                                    | 9.68                                  | 4.89                               | B41231C0398M06#                          |
| 4700                                      | 25.4 × 50                                | 0.20                                    | 10.7                                  | 5.44                               | B41231A0478M06#                          |
| 4700                                      | 30 × 40                                  | 0.20                                    | 10.6                                  | 5.39                               | B41231B0478M06#                          |
| 4700                                      | 35 × 30                                  | 0.20                                    | 10.4                                  | 5.27                               | B41231C0478M06#                          |
| 5600                                      | 30 × 45                                  | 0.20                                    | 11.7                                  | 5.91                               | B41231A0568M06#                          |
| 5600                                      | 35 × 35                                  | 0.20                                    | 11.5                                  | 5.81                               | B41231B0568M06#                          |
| 6800                                      | 35 × 40                                  | 0.20                                    | 10.8                                  | 5.46                               | B41231A0688M06#                          |
| 8200                                      | 35 × 45                                  | 0.20                                    | 13.7                                  | 6.91                               | B41231A0828M06#                          |

## **Composition of ordering code**

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

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85 °C



# Technical data and ordering codes

| $C_R$<br>120 Hz<br>20 °C<br>$\mu F$ | Case<br>dimensions<br>$d \times l$<br>mm | $\tan \delta_{\max}$<br>120 Hz<br>20 °C | $I_{AC,\max}$<br>120 Hz<br>60 °C<br>A | $I_{AC,R}$<br>120 Hz<br>85 °C<br>A | Ordering code<br>(composition see below) |
|-------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------|------------------------------------------|
| $V_R = 100 \text{ V DC}$            |                                          |                                         |                                       |                                    |                                          |
| 1200                                | 22 × 30                                  | 0.15                                    | 4.73                                  | 2.39                               | B41231A9128M06#                          |
| 1200                                | 25.4 × 25                                | 0.15                                    | 4.87                                  | 2.46                               | B41231B9128M06#                          |
| 1500                                | 22 × 35                                  | 0.15                                    | 5.60                                  | 2.83                               | B41231A9158M06#                          |
| 1500                                | 25.4 × 30                                | 0.15                                    | 5.80                                  | 2.93                               | B41231B9158M06#                          |
| 1500                                | 30 × 25                                  | 0.15                                    | 5.94                                  | 3.00                               | B41231C9158M06#                          |
| 1800                                | 22 × 40                                  | 0.15                                    | 6.45                                  | 3.26                               | B41231A9188M06#                          |
| 1800                                | 25.4 × 35                                | 0.15                                    | 6.71                                  | 3.39                               | B41231B9188M06#                          |
| 1800                                | 30 × 30                                  | 0.15                                    | 6.91                                  | 3.49                               | B41231C9188M06#                          |
| 2200                                | 22 × 45                                  | 0.15                                    | 7.09                                  | 3.58                               | B41231A9228M06#                          |
| 2200                                | 25.4 × 40                                | 0.15                                    | 7.41                                  | 3.74                               | B41231B9228M06#                          |
| 2200                                | 30 × 30                                  | 0.15                                    | 7.25                                  | 3.66                               | B41231C9228M06#                          |
| 2700                                | 25.4 × 45                                | 0.15                                    | 8.57                                  | 4.33                               | B41231A9278M06#                          |
| 2700                                | 30 × 35                                  | 0.15                                    | 8.45                                  | 4.27                               | B41231B9278M06#                          |
| 2700                                | 35 × 30                                  | 0.15                                    | 8.65                                  | 4.37                               | B41231C9278M06#                          |
| 3300                                | 25.4 × 50                                | 0.15                                    | 9.42                                  | 4.76                               | B41231A9338M06#                          |
| 3300                                | 30 × 40                                  | 0.15                                    | 9.35                                  | 4.72                               | B41231B9338M06#                          |
| 3300                                | 35 × 35                                  | 0.15                                    | 9.60                                  | 4.85                               | B41231C9338M06#                          |
| 3900                                | 30 × 45                                  | 0.15                                    | 10.6                                  | 5.36                               | B41231A9398M06#                          |
| 3900                                | 35 × 35                                  | 0.15                                    | 10.4                                  | 5.27                               | B41231B9398M06#                          |
| 4700                                | 30 × 50                                  | 0.15                                    | 11.6                                  | 5.86                               | B41231A9478M06#                          |
| 4700                                | 35 × 40                                  | 0.15                                    | 11.5                                  | 5.80                               | B41231B9478M06#                          |
| 5600                                | 35 × 45                                  | 0.15                                    | 12.5                                  | 6.34                               | B41231A9568M06#                          |

## Composition of ordering code

# = Terminal style

0 = snap-in standard terminals (6.0 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

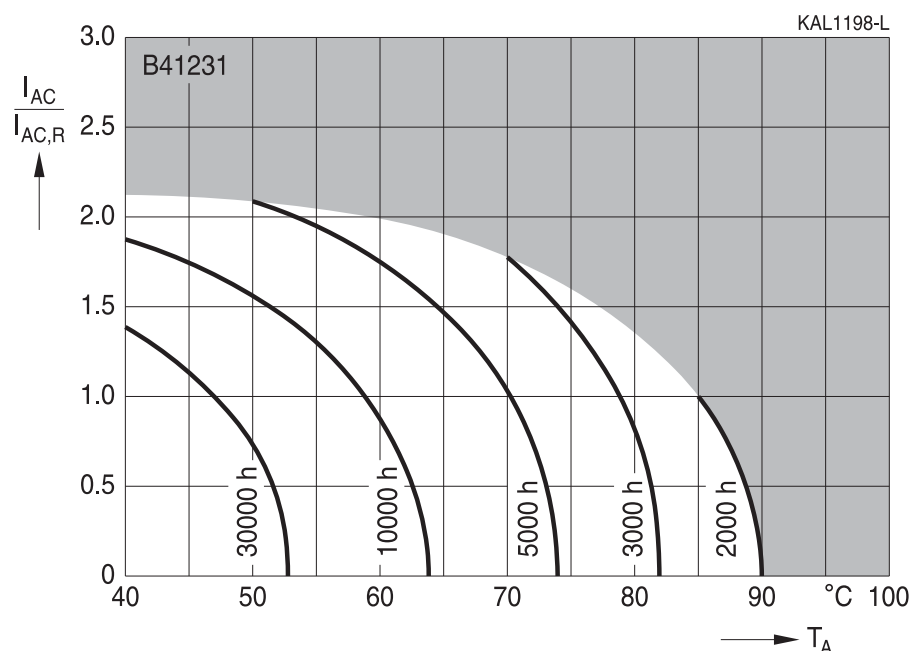


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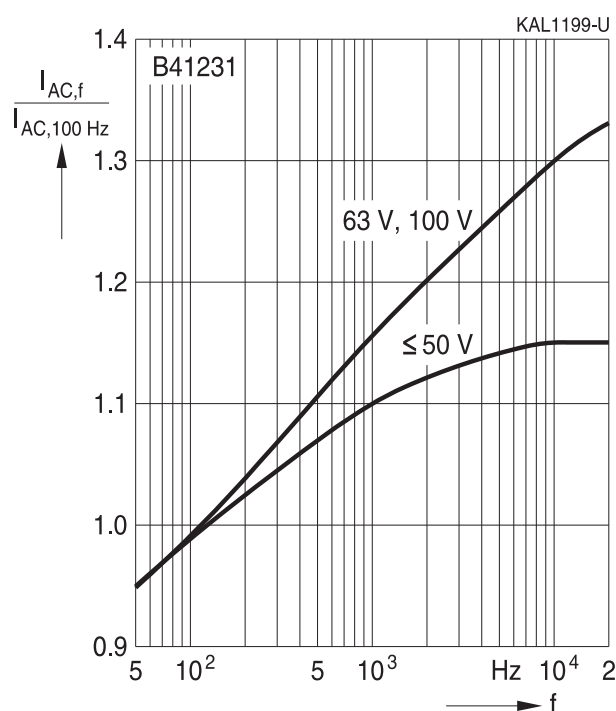
**85 °C**

### Useful life<sup>1)</sup>

depending on ambient temperature  $T_A$  under ripple current operating conditions



### Frequency factor of permissible ripple current $I_{AC}$ versus frequency $f$



### Frequency characteristics of ESR Typical behavior



1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.



# Impedance $Z$ versus frequency $f$

Typical behavior at 20 °C





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**85 °C**

## Cautions and warnings

### Personal safety

The electrolytes used have been optimized both with a view to the intended application and with regard to health and environmental compatibility. They do not contain any solvents that are detrimental to health, e.g. dimethyl formamide (DMF) or dimethyl acetamide (DMAC). Furthermore, some of the high-voltage electrolytes used are self-extinguishing.

As far as possible, we do not use any dangerous chemicals or compounds to produce operating electrolytes, although in exceptional cases, such materials must be used in order to achieve specific physical and electrical properties because no alternative materials are currently known. We do, however, restrict the amount of dangerous materials used in our products to an absolute minimum.

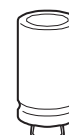
Materials and chemicals used in our aluminum electrolytic capacitors are continuously adapted in compliance with the TDK Electronics Corporate Environmental Policy and the latest EU regulations and guidelines such as RoHS, REACH/SVHC, GADSL, and ELV.

MDS (Material Data Sheets) are available on our website for all types listed in the data book.

MDS for customer specific capacitors are available upon request.

MSDS (Material Safety Data Sheets) are available for our electrolytes upon request.

Nevertheless, the following rules should be observed when handling aluminum electrolytic capacitors: No electrolyte should come into contact with eyes or skin. If electrolyte does come into contact with the skin, wash the affected areas immediately with running water. If the eyes are affected, rinse them for 10 minutes with plenty of water. If symptoms persist, seek medical treatment. Avoid inhaling electrolyte vapor or mists. Workplaces and other affected areas should be well ventilated. Clothing that has been contaminated by electrolyte must be changed and rinsed in water.



## Product safety

The table below summarizes the safety instructions that must be observed without fail. A detailed description can be found in the relevant sections of separate file chapter "General technical information".

| Topic                                          | Safety information                                                                                                                                                                                                                                                                                                                                                                                    | Reference chapter "General technical information"                |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Polarity                                       | Make sure that polar capacitors are connected with the right polarity.                                                                                                                                                                                                                                                                                                                                | 1<br>"Basic construction of aluminum electrolytic capacitors"    |
| Reverse voltage                                | Voltages of opposite polarity should be prevented by connecting a diode.                                                                                                                                                                                                                                                                                                                              | 3.1.6<br>"Reverse voltage"                                       |
| Mounting position of screw-terminal capacitors | Screw terminal capacitors must not be mounted with terminals facing down unless otherwise specified.                                                                                                                                                                                                                                                                                                  | 11.1.<br>"Mounting positions of capacitors with screw terminals" |
| Robustness of terminals                        | The following maximum tightening torques must not be exceeded when connecting screw terminals:<br>M5: 2.5 Nm<br>M6: 4.0 Nm                                                                                                                                                                                                                                                                            | 11.3<br>"Mounting torques"                                       |
| Mounting of single-ended capacitors            | The internal structure of single-ended capacitors might be damaged if excessive force is applied to the lead wires.<br>Avoid any compressive, tensile or flexural stress.<br>Do not move the capacitor after soldering to PC board.<br>Do not pick up the PC board by the soldered capacitor.<br>Do not insert the capacitor on the PC board with a hole space different to the lead space specified. | 11.4<br>"Mounting considerations for single-ended capacitors"    |
| Soldering                                      | Do not exceed the specified time or temperature limits during soldering.                                                                                                                                                                                                                                                                                                                              | 11.5<br>"Soldering"                                              |
| Soldering, cleaning agents                     | Do not allow halogenated hydrocarbons to come into contact with aluminum electrolytic capacitors.                                                                                                                                                                                                                                                                                                     | 11.6<br>"Cleaning agents"                                        |
| Upper category temperature                     | Do not exceed the upper category temperature.                                                                                                                                                                                                                                                                                                                                                         | 7.2<br>"Maximum permissible operating temperature"               |
| Passive flammability                           | Avoid external energy, e.g. fire.                                                                                                                                                                                                                                                                                                                                                                     | 8.1<br>"Passive flammability"                                    |



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| Topic                                          | Safety information                                                                                                                                                                                                                                 | Reference<br>chapter "General<br>technical information"   |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Active<br>flammability                         | Avoid overload of the capacitors.                                                                                                                                                                                                                  | 8.2<br>"Active flammability"                              |
| Maintenance                                    | Make periodic inspections of the capacitors.<br>Before the inspection, make sure that the power supply is turned off and carefully discharge the capacitors.<br>Do not apply excessive mechanical stress to the capacitor terminals when mounting. | 10<br>"Maintenance"                                       |
| Storage                                        | Do not store capacitors at high temperatures or high humidity. Capacitors should be stored at +5 to +35 °C and a relative humidity of ≤ 75%.                                                                                                       | 7.3<br>"Shelf life and storage conditions"                |
|                                                |                                                                                                                                                                                                                                                    | Reference<br>chapter "Capacitors with<br>screw terminals" |
| Breakdown strength<br>of insulating<br>sleeves | Do not damage the insulating sleeve, especially when ring clips are used for mounting.                                                                                                                                                             | "Screw terminals –<br>accessories"                        |

### Display of ordering codes for TDK Electronics products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.

Detailed information can be found on the Internet under  
[www.tdk-electronics.tdk.com/orderingcodes](http://www.tdk-electronics.tdk.com/orderingcodes).



## Symbols and terms

| Symbol        | English                                                   | German                                                    |
|---------------|-----------------------------------------------------------|-----------------------------------------------------------|
| C             | Capacitance                                               | Kapazität                                                 |
| $C_R$         | Rated capacitance                                         | Nennkapazität                                             |
| $C_S$         | Series capacitance                                        | Serienkapazität                                           |
| $C_{S,T}$     | Series capacitance at temperature T                       | Serienkapazität bei Temperatur T                          |
| $C_f$         | Capacitance at frequency f                                | Kapazität bei Frequenz f                                  |
| d             | Case diameter, nominal dimension                          | Gehäusedurchmesser, Nennmaß                               |
| $d_{max}$     | Maximum case diameter                                     | Maximaler Gehäusedurchmesser                              |
| ESL           | Self-inductance                                           | Eigeninduktivität                                         |
| ESR           | Equivalent series resistance                              | Ersatzserienwiderstand                                    |
| $ESR_f$       | Equivalent series resistance at frequency f               | Ersatzserienwiderstand bei Frequenz f                     |
| $ESR_T$       | Equivalent series resistance at temperature T             | Ersatzserienwiderstand bei Temperatur T                   |
| f             | Frequency                                                 | Frequenz                                                  |
| I             | Current                                                   | Strom                                                     |
| $I_{AC}$      | Alternating current (ripple current)                      | Wechselstrom                                              |
| $I_{AC,RMS}$  | Root-mean-square value of alternating current             | Wechselstrom, Effektivwert                                |
| $I_{AC,f}$    | Ripple current at frequency f                             | Wechselstrom bei Frequenz f                               |
| $I_{AC,max}$  | Maximum permissible ripple current                        | Maximal zulässiger Wechselstrom                           |
| $I_{AC,R}$    | Rated ripple current                                      | Nennwechselstrom                                          |
| $I_{leak}$    | Leakage current                                           | Reststrom                                                 |
| $I_{leak,op}$ | Operating leakage current                                 | Betriebsreststrom                                         |
| l             | Case length, nominal dimension                            | Gehäuselänge, Nennmaß                                     |
| $l_{max}$     | Maximum case length (without terminals and mounting stud) | Maximale Gehäuselänge (ohne Anschlüsse und Gewindebolzen) |
| R             | Resistance                                                | Widerstand                                                |
| $R_{ins}$     | Insulation resistance                                     | Isolationswiderstand                                      |
| $R_{symm}$    | Balancing resistance                                      | Symmetrierwiderstand                                      |
| T             | Temperature                                               | Temperatur                                                |
| $\Delta T$    | Temperature difference                                    | Temperaturdifferenz                                       |
| $T_A$         | Ambient temperature                                       | Umgebungstemperatur                                       |
| $T_C$         | Case temperature                                          | Gehäusetemperatur                                         |
| $T_B$         | Capacitor base temperature                                | Temperatur des Gehäusebodens                              |
| t             | Time                                                      | Zeit                                                      |
| $\Delta t$    | Period                                                    | Zeitraum                                                  |
| $t_b$         | Service life (operating hours)                            | Brauchbarkeitsdauer (Betriebszeit)                        |



**B41231**

**85 °C**

| Symbol          | English                     | German                            |
|-----------------|-----------------------------|-----------------------------------|
| V               | Voltage                     | Spannung                          |
| V <sub>F</sub>  | Forming voltage             | Formierspannung                   |
| V <sub>op</sub> | Operating voltage           | Betriebsspannung                  |
| V <sub>R</sub>  | Rated voltage, DC voltage   | Nennspannung, Gleichspannung      |
| V <sub>S</sub>  | Surge voltage               | Spitzenspannung                   |
| X <sub>C</sub>  | Capacitive reactance        | Kapazitiver Blindwiderstand       |
| X <sub>L</sub>  | Inductive reactance         | Induktiver Blindwiderstand        |
| Z               | Impedance                   | Scheinwiderstand                  |
| Z <sub>T</sub>  | Impedance at temperature T  | Scheinwiderstand bei Temperatur T |
| tan δ           | Dissipation factor          | Verlustfaktor                     |
| λ               | Failure rate                | Ausfallrate                       |
| ε <sub>0</sub>  | Absolute permittivity       | Elektrische Feldkonstante         |
| ε <sub>r</sub>  | Relative permittivity       | Dielektrizitätszahl               |
| ω               | Angular velocity; 2 · π · f | Kreisfrequenz; 2 · π · f          |

## Note

All dimensions are given in mm.

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