

**Long-life grade capacitors
for professional applications**

Applications

- For use in output circuits of switch-mode power supplies of compact design
- For professional industrial electronics, telecommunications and data processing equipment

Features

- Low equivalent series resistance *ESR*
- Low impedance
- High ripple current capability

Construction

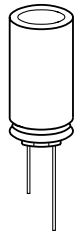
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on insulating sleeve
- Case with safety vent
- Stand off rubber seal

Delivery mode

Special terminal configurations and packing:

- Bulk
- Taped, Ammo pack
- Cut
- Kinked
- PAPR (protection against polarity reversal)

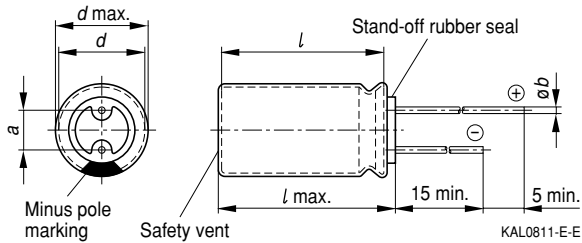
Refer to page 503 for further details and ordering example.



KAL0707-F


B41856
Low Impedance – 105 °C
Specifications and characteristics in brief

| | | |
|---|---|---|
| Rated voltage U_R | 6,3 ... 100 VDC | |
| Surge voltage U_S | $1,15 \cdot U_R$ | |
| Rated capacitance C_R | 22 ... 4 700 μF | |
| Capacitance tolerance | $\pm 20 \% \triangleq M$ | |
| Useful life 105 °C; U_R ; I_{-R} | > 4 000 h | Requirements: $\Delta C/C \leq \pm 40 \%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: ≤ 100 fit ($\leq 100 \cdot 10^{-9}/\text{h}$) (for definition "fit", refer to chapter "Quality", page 62) |
| Voltage endurance test 105 °C; U_R | 2 000 h | Post test requirements: $\Delta C/C \leq \pm 20 \%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_L \leq$ initial specified limit |
| Vibration resistance | To IEC 60068-2-6, test Fc: displacement amplitude 0,75 mm, frequency range 10 ... 2 000 Hz, acceleration max. 10 g, duration 3×2 h | |
| IEC climatic category | To IEC 60068-1: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test) | |
| Sectional specification | IEC 60384-4 | |


Dimensional drawings

Dimensions and weights

| Dimensions (mm) | | | | Approx. weight |
|-----------------|----------------------------|-------------|-------------|----------------|
| $d \times l$ | $d_{\max} \times l_{\max}$ | $a \pm 0,5$ | b | g |
| 8 × 11 | 8,5 × 12 | 3,5 | 0,60 ± 0,05 | 1,0 |
| 10 × 12,5 | 10,5 × 13,5 | 5,0 | 0,60 ± 0,05 | 1,6 |
| 10 × 16 | 10,5 × 17 | 5,0 | 0,60 ± 0,05 | 1,9 |
| 10 × 20 | 10,5 × 22 | 5,0 | 0,60 ± 0,05 | 2,6 |
| 12,5 × 25 | 13 × 27 | 5,0 | 0,60 ± 0,05 | 4,5 |
| 16 × 20 | 16,5 × 22 | 7,5 | 0,80 ± 0,05 | 5,5 |
| 16 × 25 | 16,5 × 27 | 7,5 | 0,80 ± 0,05 | 7,5 |
| 16 × 31,5 | 16,5 × 33,5 | 7,5 | 0,80 ± 0,05 | 7,8 |
| 18 × 31,5 | 18,5 × 32,5 | 7,5 | 0,80 ± 0,1 | 11 |
| 18 × 35 | 18,5 × 36 | 7,5 | 0,80 ± 0,1 | 13 |
| 18 × 40 | 18,5 × 41 | 7,5 | 0,80 ± 0,1 | 16 |


B41856
Low Impedance – 105 °C
Overview of available types

| U_R (VDC) | 6,3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
|------------------|-----------------------------------|----------|---------|----------|---------|----------|----------|----------|
| C_R (μ F) | Case dimensions $d \times l$ (mm) | | | | | | | |
| 22 | | | | | | | | 10 ×12,5 |
| 33 | | | | | | | | 10 ×16 |
| 47 | | | | | | | 10 ×12,5 | 10 ×20 |
| 100 | | | | | 8×11 | 10 ×12,5 | 10 ×20 | 12,5×25 |
| 220 | | | 8×11 | 10 ×12,5 | 10×12,5 | 10 ×16 | 12,5×25 | 16 ×31,5 |
| 330 | | 8 ×11 | | 10 ×12,5 | 10×16 | 10 ×20 | 12,5×25 | 18 ×31,5 |
| 470 | | 10 ×12,5 | 10×16 | | 10×20 | 12,5×25 | 16 ×25 | 18 ×35 |
| 1 000 | | 10 ×16 | 10×20 | 12,5×25 | 16×20 | 16 ×25 | 18 ×35 | |
| 1 500 | 10×20 | | | | | | | |
| 2 200 | | 12,5×25 | 16×20 | 16 ×25 | 16×31,5 | 18 ×40 | | |
| 3 300 | | 16 ×20 | 16×25 | 16 ×31,5 | 18×35 | | | |
| 4 700 | | 16 ×25 | 16×31,5 | 18 ×35 | | | | |

Other capacitance and voltage ratings are available upon request.


Technical data and ordering codes

| U_R | C_R 120 Hz 20 °C μF | Case dimensions $d \times l$ mm | $I_{L, \max}$ 5 min 20 °C μA | $\tan \delta_{\max}$ 120 Hz 20 °C | ESR_{\max} 120 Hz 20 °C Ω | Z_{\max} 100 kHz 20 °C Ω | $I_{\sim R}$ 100 kHz 105 °C mA | Ordering code ¹⁾ |
|-------|--------------------------------|--|---------------------------------------|---|--------------------------------------|-------------------------------------|---|-----------------------------|
| 6,3 | 1 500 | 10 × 20 | 95 | 0,22 | 0,24 | 0,044 | 1 200 | B41856A2158M00* |
| 10 | 330 | 8 × 11 | 99 | 0,20 | 1,01 | 0,340 | 310 | B41856A3337M00* |
| | 470 | 10 × 12,5 | 141 | 0,20 | 0,71 | 0,340 | 370 | B41856A3477M00* |
| | 1 000 | 10 × 16 | 300 | 0,20 | 0,33 | 0,170 | 640 | B41856A3108M00* |
| | 2 200 | 12,5 × 25 | 660 | 0,22 | 0,17 | 0,090 | 1 000 | B41856A3228M00* |
| | 3 300 | 16 × 20 | 990 | 0,24 | 0,12 | 0,069 | 1 250 | B41856A3338M00* |
| | 4 700 | 16 × 25 | 1 410 | 0,26 | 0,09 | 0,046 | 1 400 | B41856A3478M00* |
| 16 | 220 | 8 × 11 | 106 | 0,16 | 1,21 | 0,340 | 328 | B41856A4227M00* |
| | 470 | 10 × 16 | 226 | 0,16 | 0,56 | 0,230 | 480 | B41856A4477M00* |
| | 1 000 | 10 × 20 | 480 | 0,16 | 0,27 | 0,140 | 800 | B41856A4108M00* |
| | 2 200 | 16 × 20 | 1 056 | 0,18 | 0,14 | 0,069 | 1 150 | B41856A4228M00* |
| | 3 300 | 16 × 25 | 1 584 | 0,20 | 0,10 | 0,046 | 1 400 | B41856A4338M00* |
| | 4 700 | 16 × 31,5 | 2 256 | 0,22 | 0,08 | 0,040 | 1 750 | B41856A4478M00* |
| 25 | 220 | 10 × 12,5 | 165 | 0,14 | 1,06 | 0,340 | 328 | B41856A5227M00* |
| | 330 | 10 × 12,5 | 248 | 0,14 | 0,70 | 0,230 | 480 | B41856A5337M00* |
| | 1 000 | 12,5 × 25 | 750 | 0,14 | 0,23 | 0,090 | 1 000 | B41856A5108M00* |
| | 2 200 | 16 × 25 | 1 650 | 0,16 | 0,12 | 0,046 | 1 400 | B41856A5228M00* |
| | 3 300 | 16 × 31,5 | 2 475 | 0,18 | 0,09 | 0,040 | 1 750 | B41856A5338M00* |
| | 4 700 | 18 × 35 | 3 555 | 0,20 | 0,07 | 0,036 | 2 000 | B41856A5478M00* |
| 35 | 100 | 8 × 11 | 105 | 0,12 | 1,99 | 0,340 | 328 | B41856A7107M00* |
| | 220 | 10 × 12,5 | 231 | 0,12 | 0,90 | 0,230 | 480 | B41856A7227M00* |
| | 330 | 10 × 16 | 347 | 0,12 | 0,60 | 0,170 | 640 | B41856A7337M00* |
| | 470 | 10 × 20 | 494 | 0,12 | 0,42 | 0,140 | 800 | B41856A7477M00* |
| | 1 000 | 16 × 20 | 1 050 | 0,12 | 0,20 | 0,069 | 1 150 | B41856A7108M00* |
| | 2 200 | 16 × 31,5 | 2 310 | 0,14 | 0,11 | 0,040 | 1 750 | B41856A7228M00* |
| | 3 300 | 18 × 35 | 3 465 | 0,16 | 0,08 | 0,036 | 2 000 | B41856A7338M00* |

Preferred types

1) * = "0" for bulk version..

For taping versions, other lead configurations and packing information see page 503

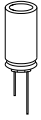

B41856
Low Impedance – 105 °C
Technical data and ordering codes

| U_R | C_R | Case dimensions | $I_{L, \max}$ | $\tan \delta_{\max}$ | ESR_{\max} | Z_{\max} | $I_{\sim R}$ | Ordering code ¹⁾ |
|-------|----------------------------------|--------------------|---------------------------------|----------------------|-----------------------------|------------------------------|-------------------------|-----------------------------|
| VDC | 120 Hz 20 °C μF | $d \times l$ mm | 5 min 20 °C μA | 120 Hz 20 °C | 120 Hz 20 °C Ω | 100 kHz 20 °C Ω | 100 kHz 105 °C mA | |
| 50 | 100 | 10 × 12,5 | 150 | 0,10 | 1,66 | 0,400 | 270 | B41856A6107M00* |
| | 220 | 10 × 16 | 330 | 0,10 | 0,75 | 0,220 | 500 | B41856A6227M00* |
| | 330 | 10 × 20 | 495 | 0,10 | 0,50 | 0,180 | 640 | B41856A6337M00* |
| | 470 | 12,5 × 25 | 705 | 0,10 | 0,35 | 0,160 | 800 | B41856A6477M00* |
| | 1 000 | 16 × 25 | 1 500 | 0,10 | 0,17 | 0,060 | 1 200 | B41856A6108M00* |
| | 2 200 | 18 × 35 | 3 300 | 0,12 | 0,09 | 0,042 | 1 700 | B41856A6228M00* |
| 63 | 47 | 10 × 12,5 | 89 | 0,08 | 2,82 | 0,70 | 280 | B41856A8476M00* |
| | 100 | 10 × 20 | 189 | 0,08 | 1,33 | 0,40 | 500 | B41856A8107M00* |
| | 220 | 12,5 × 25 | 416 | 0,08 | 0,60 | 0,23 | 850 | B41856A8227M00* |
| | 330 | 12,5 × 25 | 624 | 0,08 | 0,40 | 0,20 | 890 | B41856A8337M00* |
| | 470 | 16 × 25 | 888 | 0,08 | 0,28 | 0,10 | 1 400 | B41856A8477M00* |
| | 1 000 | 18 × 35 | 1 890 | 0,08 | 0,13 | 0,070 | 1 900 | B41856A8108M00* |
| 100 | 22 | 10 × 12,5 | 66 | 0,07 | 5,28 | 0,70 | 280 | B41856A9226M00* |
| | 33 | 10 × 16 | 99 | 0,07 | 3,52 | 0,42 | 480 | B41856A9336M00* |
| | 47 | 10 × 20 | 141 | 0,07 | 2,47 | 0,35 | 550 | B41856A9476M00* |
| | 100 | 12,5 × 25 | 300 | 0,07 | 1,16 | 0,18 | 850 | B41856A9107M00* |
| | 220 | 16 × 31,5 | 660 | 0,07 | 0,53 | 0,13 | 1 400 | B41856A9227M00* |
| | 330 | 18 × 31,5 | 990 | 0,07 | 0,35 | 0,085 | 1 700 | B41856A9337M00* |
| | 470 | 18 × 35 | 1 410 | 0,07 | 0,25 | 0,062 | 2 000 | B41856A9477M00* |

Preferred types

1) * = "0" for bulk version.

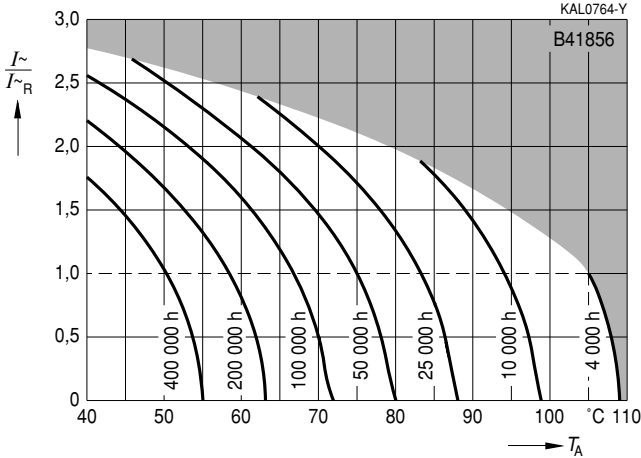
For taping versions, other lead configurations and packing information see page 503.



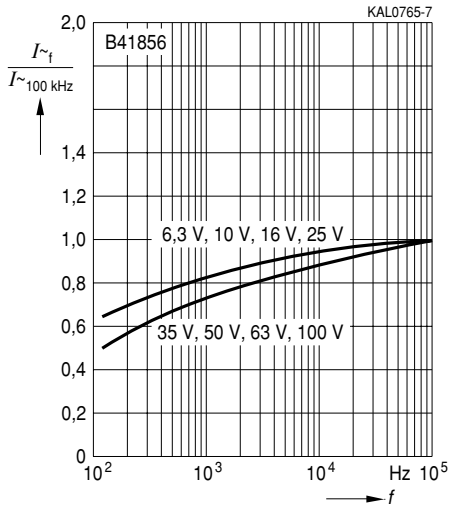
Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾

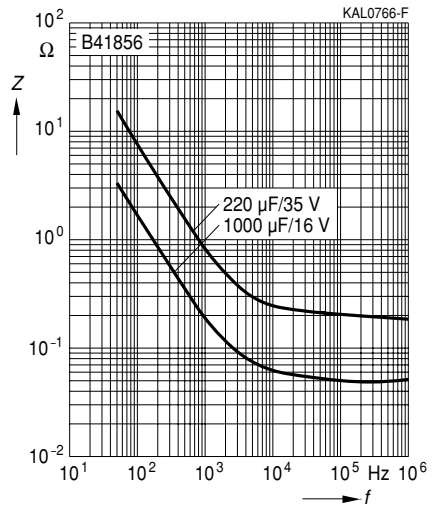
$U_R = 6,3 \dots 50$ VDC



Frequency factor of permissible ripple current I_{\sim} versus frequency f



Impedance Z versus frequency f
Typical behavior at 20 °C



1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

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