

GP grade

Standard type with small dimensions

Construction

- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Negative pole connected to case
- Axial leads, welded to ensure perfect electrical contact

Features

- Standard type with small dimensions
- Operation at temperatures up to 105 °C¹⁾
- Good electrical characteristics
- High ripple current capability

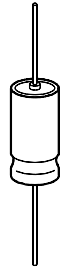
Applications

- For general-purpose applications in entertainment electronics
- Semi-professional to professional application range
- For filtering, coupling and pulse circuits

Tape packaging

Capacitors with $d \leq 16$ mm are also available on tape.

Refer to [page 420](#) for information on tapes and examples on how to order them.



KAL0277-Z

Specifications and characteristics in brief

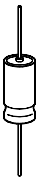
| | | |
|--|---|---|
| Rated voltage U_R | 6,3 to 100 V- | |
| Surge voltage U_S | $1,15 \cdot U_R$ | |
| Rated capacitance C_R | 4,7 to 10 000 μ F | |
| Capacitance tolerance | - 10/+ 50 % \cong T | |
| Useful life | $d \leq 10$ mm | $d \geq 12$ mm |
| 40 °C, U_R | > 200 000 h ($I_{-R,85^\circ C}$) | > 200 000 h ($1,4 \cdot I_{-R,85^\circ C}$) |
| 85 °C, U_R ; I_{-max} | > 3 000 h | > 4 000 h |
| Failure percentage | ≤ 1 % (during useful life) | |
| Failure rate (1 fit = $1 \cdot 10^{-9}$ /h) | $d \leq 10$ mm: ≤ 100 fit $d \geq 12$ mm: ≤ 40 fit | |
| Voltage endurance test | 2 000 h, 85 °C (at U_R) | |
| Leakage current I_{lka} (5 min, 20 °C) | $I_{lka} \leq 0,3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V} \right)^{0,7} + 4 \mu A$ | |

1) Operation at 105 °C and 0,6 $I_{-max,85^\circ C}$ permissible for a total of 500 h.



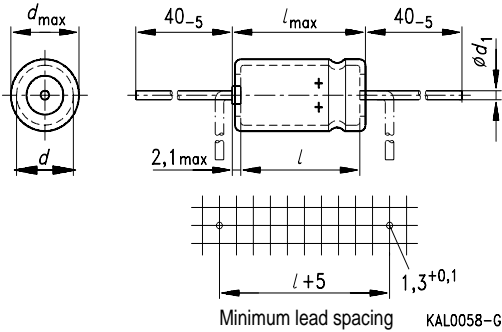
Specifications and characteristics in brief

| | | | | | | | | | | |
|---------------------------|--|------|------|----|----|----|----|------|----|----|
| Self-inductance L_{ESL} | d (mm) | 6,5 | 8,5 | 10 | 12 | 14 | 16 | 18 | 21 | 25 |
| | l (mm) | 15,5 | 15,5 | 25 | 30 | 30 | 30 | 39,5 | 40 | 40 |
| | L_{ESL} approx. (nH) | 14 | 17 | 35 | 37 | 38 | 45 | 57 | 30 | 34 |
| IEC climatic category | in accordance with IEC 68-1 40/085/56 (−40 °C/+85 °C, 56 days damp heat test) | | | | | | | | | |
| Detail specification | similar to CECC 30 301-044 | | | | | | | | | |
| Sectional specification | IEC 384-4 | | | | | | | | | |
| Vibration resistance | in accordance with IEC 68-2-6, test Fc: displacement amplitude 0,35 mm, frequency range 10 to 55 Hz, acceleration max. 5 g, duration 3 × 2 h | | | | | | | | | |



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Dimensional drawing



| Type | Dimensions (mm) | | Lead wire diameter d_1 | Approximate weight (g) |
|----------|-----------------|--------------------------|--------------------------|------------------------|
| | $d \times l$ | $d_{max} \times l_{max}$ | | |
| B 41 283 | 6,5 × 15,5 | 7 × 17 | 0,6 | 1,1 |
| | 8,5 × 15,5 | 9 × 17 | | 1,8 |
| | 10 × 25 | 10,5 × 26,5 | | 3,2 |
| B 41 010 | 12 × 30 | 12,5 × 32 | 0,8 | 5,4 |
| | 14 × 30 | 14,5 × 32 | | 7,5 |
| | 16 × 30 | 16,5 × 32 | | 9,3 |
| | 18 × 39,5 | 18,5 × 40,3 | | 14 |
| | 21 × 40 | 21,5 × 41,5 | | 18 |
| | 25 × 40 | 25,5 × 41,5 | | 26 |

Packing units

| Case dimensions $d \times l$ (mm) | Bulk PU (pcs.) | Reel packing PU (pcs./reel) |
|--------------------------------------|-------------------|--------------------------------|
| 6,5 × 15,5 | 2000 | 1300 |
| 8,5 × 15,5 | 1500 | 1000 |
| 10 × 25 | 900 | 600 |
| 12 × 30 | 600 | 450 |
| 14 × 30 | 400 | 350 |
| 16 × 30 | 350 | 250 |
| 18 × 39,5 | 250 | — |
| 21 × 40 | 200 | — |
| 25 × 40 | 150 | — |

Not for new design. For new design see types B 41 682, [page 365](#)

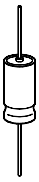


Overview of available types

| U_R (V-) | 6,3 | 10 | 16 | 25 | 40 | 63 | 100 |
|------------------|-----------------------------------|------------|------------|------------|------------|------------|------------|
| C_R (μ F) | Case dimensions $d \times l$ (mm) | | | | | | |
| 4,7 | | | | | | | 6,5 × 15,5 |
| 10 | | | | | | 6,5 × 15,5 | 8,5 × 15,5 |
| 22 | | | | | 6,5 × 15,5 | 8,5 × 15,5 | 8,5 × 15,5 |
| 47 | | | | 6,5 × 15,5 | 8,5 × 15,5 | 8,5 × 15,5 | 10 × 25 |
| 100 | | 6,5 × 15,5 | 8,5 × 15,5 | 8,5 × 15,5 | 10 × 25 | 10 × 25 | 12 × 30 |
| 220 | | 8,5 × 15,5 | 8,5 × 15,5 | 10 × 25 | 10 × 25 | 12 × 30 | 16 × 30 |
| 470 | 8,5 × 15,5 | 10 × 25 | 10 × 25 | 12 × 30 | 12 × 30 | 16 × 30 | 21 × 40 |
| 1 000 | 10 × 25 | 12 × 30 | 12 × 30 | 14 × 30 | 16 × 30 | 21 × 40 | |
| 2 200 | 12 × 30 | 14 × 30 | 16 × 30 | 18 × 39,5 | 21 × 40 | | |
| 4 700 | 16 × 30 | 18 × 39,5 | 21 × 40 | 25 × 40 | | | |
| 10 000 | | 25 × 40 | | | | | |

The above capacitance and voltage ratings are available in different cases upon request. Other voltage and capacitance ratings are also available upon request.

Not for new design. For new design see type B 41 682, [page 365](#)



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Technical data and ordering codes

| U_R | C_R | Case dimensions $d \times l$ mm | $R_{ESR, typ}$ 100 Hz 20 °C Ω | $R_{ESR, max}$ 100 Hz 20 °C Ω | Z_{max} 10 kHz 20 °C Ω | I_{-max} 100 Hz 40 °C A | I_{-R} 100 Hz 85 °C A | Ordering code ¹⁾ Short code |
|--|--------|---------------------------------------|---|---|--|------------------------------------|----------------------------------|---|
| B41010- ($d \geq 12$ mm), B41283- ($d \leq 10$ mm) | | | | | | | | |
| 6,3 | 470 | 8,5 × 15,5 | 0,44 | 0,75 | 0,46 | 0,73 | 0,25 | -D2477-T90 |
| | 1 000 | 10 × 25 | 0,24 | 0,35 | 0,22 | 1,2 | 0,42 | -B2108-T90 |
| | 2 200 | 12 × 30 | 0,12 | 0,19 | 0,10 | 2,1 | 0,71 | -B2228-T |
| | 4 700 | 16 × 30 | 0,08 | 0,11 | 0,05 | 3,2 | 1,1 | -E2478-T |
| 10 | 100 | 6,5 × 15,5 | 1,5 | 3,5 | 1,7 | 0,35 | 0,12 | -C3107-T90 |
| | 220 | 8,5 × 15,5 | 0,65 | 1,4 | 0,79 | 0,61 | 0,21 | -D3227-T90 |
| | 470 | 10 × 25 | 0,32 | 0,68 | 0,37 | 1,0 | 0,36 | -B3477-T90 |
| | 1 000 | 12 × 30 | 0,18 | 0,32 | 0,16 | 1,7 | 0,57 | -A3108-T |
| | 2 200 | 14 × 30 | 0,19 | 0,18 | 0,08 | 2,3 | 0,81 | -C3228-T |
| | 4 700 | 18 × 39,5 | 0,06 | 0,10 | 0,05 | 4,1 | 1,4 | -C3478-T |
| | 10 000 | 25 × 40 | 0,05 | 0,07 | 0,05 | 5,5 | 1,9 | -C3109-T |
| 16 | 100 | 8,5 × 15,5 | 1,3 | 2,8 | 1,4 | 0,41 | 0,14 | -C4107-T90 |
| | 220 | 8,5 × 15,5 | 0,58 | 1,3 | 0,65 | 0,61 | 0,21 | -C4227-T90 |
| | 470 | 10 × 25 | 0,27 | 0,60 | 0,30 | 1,1 | 0,39 | -B4477-T90 |
| | 1 000 | 12 × 30 | 0,15 | 0,28 | 0,13 | 1,8 | 0,63 | -B4108-T |
| | 2 200 | 16 × 30 | 0,09 | 0,16 | 0,06 | 2,7 | 0,93 | -E4228-T |
| | 4 700 | 21 × 40 | 0,06 | 0,09 | 0,05 | 4,4 | 1,5 | -C4478-T |
| 25 | 47 | 6,5 × 15,5 | 2,4 | 5,3 | 2,1 | 0,26 | 0,09 | -C5476-T90 |
| | 100 | 8,5 × 15,5 | 1,0 | 2,5 | 1,0 | 0,46 | 0,16 | -C5107-T90 |
| | 220 | 10 × 25 | 0,44 | 1,1 | 0,45 | 0,81 | 0,28 | -C5227-T90 |
| | 470 | 12 × 30 | 0,21 | 0,53 | 0,19 | 1,5 | 0,53 | -B5477-T |
| | 1 000 | 14 × 30 | 0,12 | 0,25 | 0,09 | 2,1 | 0,74 | -C5108-T |
| | 2 200 | 18 × 39,5 | 0,07 | 0,14 | 0,05 | 3,8 | 1,3 | -C5228-T |
| | 4 700 | 25 × 40 | 0,05 | 0,09 | 0,05 | 5,2 | 1,8 | -C5478-T |

Not for new design. For new design see type B 41 682, [page 365](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B41283-D2477-T90
B41283-... ($d \leq 10$ mm)
B41010-... ($d \geq 12$ mm)

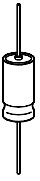


Technical data and ordering codes

| U_R | C_R | Case dimensions $d \times l$ mm | $R_{ESR, typ}$ 100 Hz 20 °C Ω | $R_{ESR, max}$ 100 Hz 20 °C Ω | Z_{max} 10 kHz 20 °C Ω | I_{-max} 100 Hz 40 °C A | I_{-R} 100 Hz 85 °C A | Ordering code ¹⁾ Short code |
|--|-------|---------------------------------------|---|---|--|------------------------------------|----------------------------------|---|
| B41010- ($d \geq 12$ mm), B41283- ($d \leq 10$ mm) | | | | | | | | |
| 40 | 22 | 6,5 × 15,5 | 4,0 | 8,0 | 3,6 | 0,20 | 0,07 | -C7226-T90 |
| | 47 | 8,5 × 15,5 | 1,5 | 3,8 | 1,7 | 0,38 | 0,13 | -E7476-T90 |
| | 100 | 10 × 25 | 0,70 | 1,8 | 0,80 | 0,64 | 0,22 | -C7107-T90 |
| | 220 | 10 × 25 | 0,36 | 0,80 | 0,36 | 0,96 | 0,33 | -B7227-T90 |
| | 470 | 12 × 30 | 0,18 | 0,38 | 0,15 | 1,7 | 0,57 | -B7477-T |
| | 1 000 | 16 × 30 | 0,10 | 0,18 | 0,08 | 2,6 | 0,88 | -E7108-T |
| | 2 200 | 21 × 40 | 0,07 | 0,11 | 0,05 | 4,1 | 1,4 | -C7228-T |
| | 63 | 10 | 6,5 × 15,5 | 5,0 | 13 | 6,0 | 0,17 | 0,06 |
| 22 | | 8,5 × 15,5 | 2,5 | 6,3 | 2,7 | 0,29 | 0,10 | -D8226-T90 |
| 47 | | 8,5 × 15,5 | 1,2 | 3,0 | 1,2 | 0,44 | 0,15 | -D8476-T90 |
| 100 | | 10 × 25 | 0,55 | 1,4 | 0,60 | 0,78 | 0,27 | -B8107-T90 |
| 220 | | 12 × 30 | 0,30 | 0,64 | 0,25 | 1,3 | 0,44 | -B8227-T |
| 470 | | 16 × 30 | 0,14 | 0,30 | 0,12 | 2,1 | 0,74 | -D8477-T |
| 1 000 | | 21 × 40 | 0,08 | 0,14 | 0,06 | 3,8 | 1,3 | -B8108-T |
| 100 | | 4,7 | 6,5 × 15,5 | 9,5 | 24 | 10 | 0,15 | 0,05 |
| | 10 | 8,5 × 15,5 | 4,0 | 10 | 5,0 | 0,23 | 0,08 | -L9106-T90 |
| | 22 | 8,5 × 15,5 | 1,8 | 4,5 | 2,2 | 0,35 | 0,12 | -D9226-T90 |
| | 47 | 10 × 25 | 0,85 | 2,1 | 1,0 | 0,64 | 0,22 | -B9476-T90 |
| | 100 | 12 × 30 | 0,40 | 1,0 | 0,45 | 1,1 | 0,38 | -B9107-T |
| | 220 | 16 × 30 | 0,22 | 0,55 | 0,20 | 1,7 | 0,59 | -E9227-T |
| | 470 | 21 × 40 | 0,12 | 0,26 | 0,10 | 2,9 | 1,0 | -B9477-T |

Not for new design. For new design see type B 41 682, [page 365](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B41283-C7226-T90
B41283-... ($d \leq 10$ mm)
B41010-... ($d \geq 12$ mm)

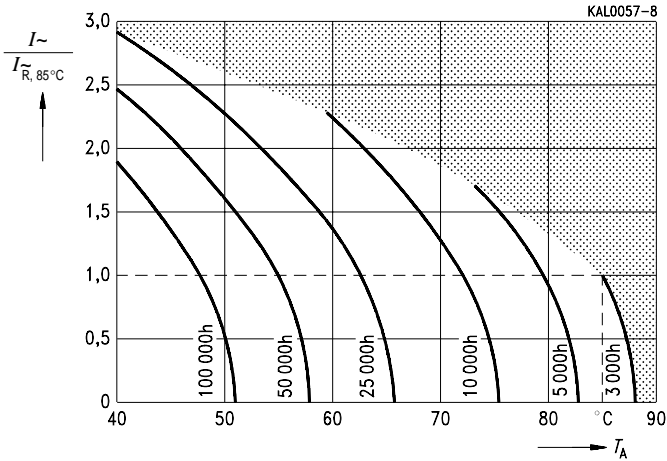


B 41 010
B 41 283

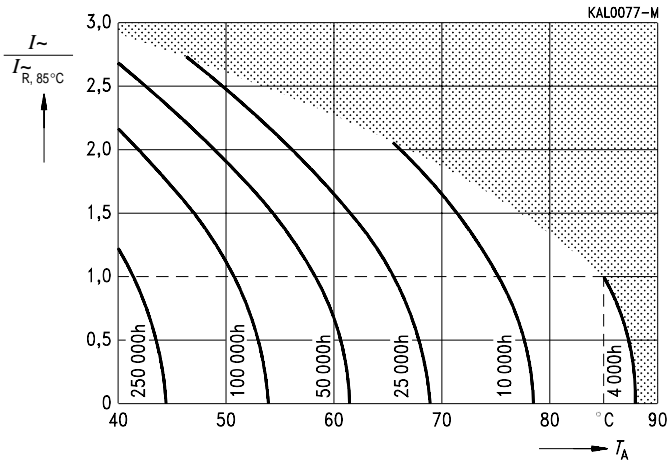
Useful life

versus ambient temperature T_A under ripple current operating conditions¹⁾

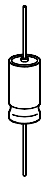
B 41 283 ($d \leq 10$ mm)



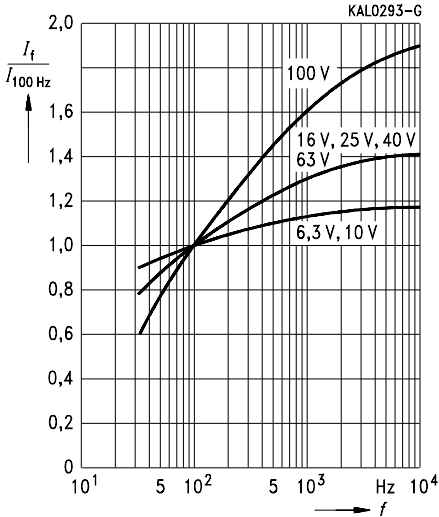
B 41 010 ($d \geq 12$ mm)



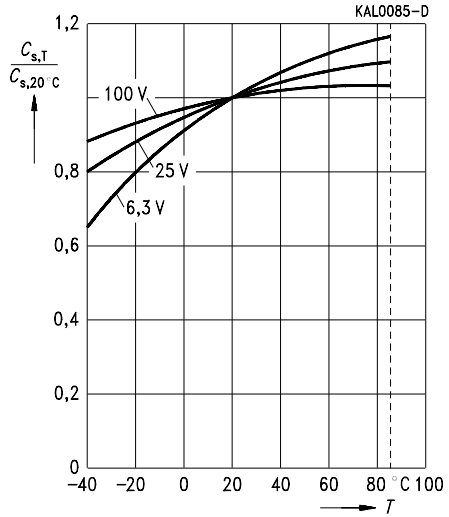
1) Refer to [page 34](#) for an explanation on how to interpret the useful life graphs.



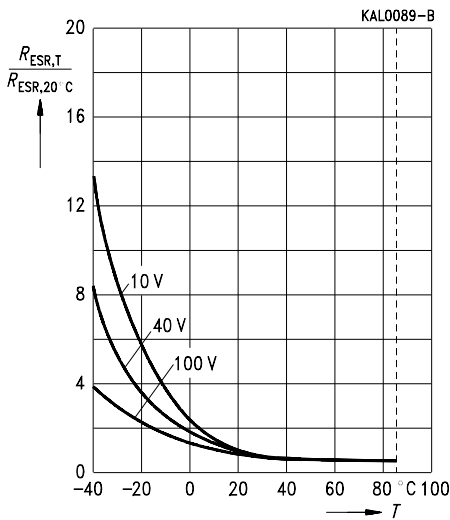
Permissible ripple current I_f
versus frequency f



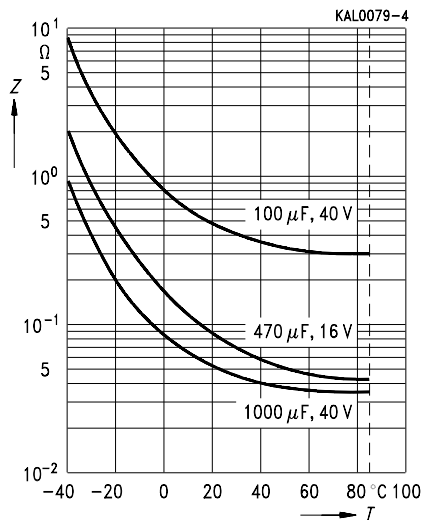
Series capacitance C_s at $f = 100$ Hz
versus temperature T
Typical behavior

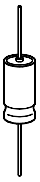


Equivalent series resistance R_{ESR}
at $f = 100$ Hz
versus temperature T
Typical behavior



Impedance Z
at $f = 10$ kHz
versus temperature T
Typical behavior

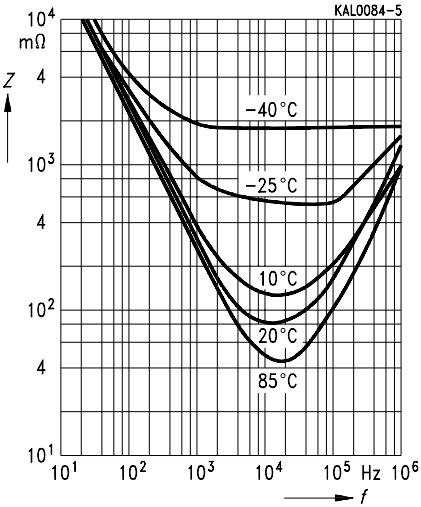




B 41 010
B 41 283

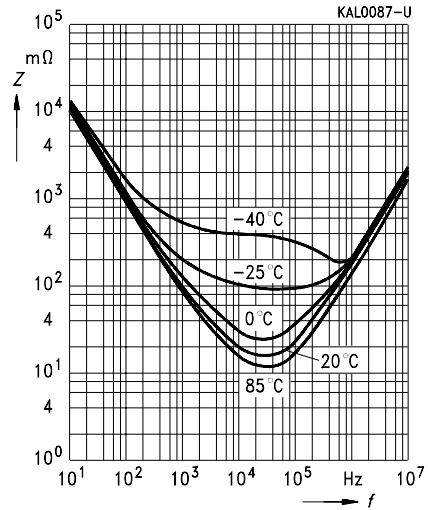
Impedance Z

versus frequency f
and temperature T for 470 $\mu\text{F}/16\text{ V}$ —
Typical behavior



Impedance Z

versus frequency f
and temperature T for 1000 $\mu\text{F}/40\text{ V}$ —
Typical behavior



Impedance Z

versus frequency f
Typical values at 20 °C
 $U_R \leq 100\text{ V}$ —

