

**Flat-winding type for
standard applications**

Construction

- Dielectric: polyethylene terephthalate (polyester)
- Flat winding
- Insulating sleeve
- Face ends sealed with epoxy resin

Terminals

- Central axial wire leads, tinned

Marking

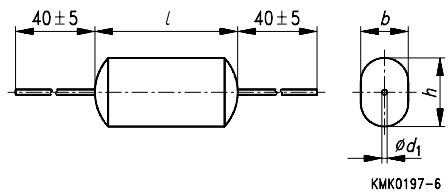
Manufacturer's logo, style (MKT), rated capacitance, capacitance tolerance (code letter), rated dc voltage

Delivery mode

Bulk (untaped)

Detail specification

DIN 44 113



Dimensions in mm

Width b_{\max}	$\leq 6,0$	7,0...13,0
Diameter d_1	0,6	0,8

When bending leads take care to leave a clearance of 1 mm to the capacitor body.

Overview of available types

Type	B 32 231			
10 nF				630 Vdc
15 nF				
22 nF				
33 nF				
47 nF				
68 nF				
0,10 µF				
0,15 µF	100 Vdc	250 Vdc	400 Vdc	
0,22 µF				
0,33 µF				
0,47 µF				
0,68 µF				
1,0 µF				
1,5 µF				
2,2 µF				
3,3 µF				
4,7 µF				
6,8 µF				
10 µF				

Ordering codes and packing units

V_R (V_{rms} , $f \leq 60$ Hz)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code ¹⁾	Packing units (pcs) Untaped
100 Vdc (63 Vac)	0,15 μ F	5,5 \times 8,5 \times 14,0	B32231-D1154-+	1500
	0,22 μ F	5,5 \times 8,5 \times 14,0	B32231-D1224-+	1500
	0,33 μ F	5,5 \times 8,5 \times 14,0	B32231-D1334-+	1500
	0,47 μ F	5,5 \times 9,0 \times 19,0	B32231-D1474-+	1500
	0,68 μ F	5,5 \times 9,0 \times 19,0	B32231-D1684-+	1500
	1,0 μ F	7,0 \times 12,0 \times 19,0	B32231-D1105-+	1000
	1,5 μ F	8,0 \times 13,0 \times 19,0	B32231-D1155-+	1000
	2,2 μ F	8,0 \times 13,0 \times 27,0	B32231-D1225-+	1000
	3,3 μ F	8,0 \times 15,0 \times 27,0	B32231-D1335-+	1000
	4,7 μ F	10,0 \times 18,0 \times 32,0	B32231-D1475-+	500
	6,8 μ F	10,0 \times 20,0 \times 32,0	B32231-D1685-+	500
	10 μ F	13,0 \times 23,0 \times 32,0	B32231-D1106-+	250
	250 Vdc (160 Vac)	47 nF	5,5 \times 8,5 \times 14,0	B32231-D3473-+
68 nF		5,5 \times 9,0 \times 14,0	B32231-D3683-+	1500
0,10 μ F		5,5 \times 8,5 \times 14,0	B32231-D3104-+	1500
0,15 μ F		5,5 \times 8,5 \times 14,0	B32231-D3154-+	1500
0,22 μ F		5,5 \times 9,0 \times 19,0	B32231-D3224-+	1500
0,33 μ F		5,5 \times 9,0 \times 19,0	B32231-D3334-+	1500
0,47 μ F		6,0 \times 12,0 \times 19,0	B32231-D3474-+	1000
0,68 μ F		7,5 \times 12,0 \times 19,0	B32231-D3684-+	1000
1,0 μ F		7,5 \times 12,0 \times 27,0	B32231-D3105-+	1000
1,5 μ F		8,5 \times 14,0 \times 27,0	B32231-D3155-+	1000
2,2 μ F		8,5 \times 16,0 \times 27,0	B32231-D3225-+	1000
3,3 μ F		10,0 \times 18,0 \times 32,0	B32231-D3335-+	500
4,7 μ F		13,0 \times 20,0 \times 32,0	B32231-D3475-+	250

Capacitance tolerance: $\pm 20\% \hat{=}$ M, $\pm 10\% \hat{=}$ K, ($\pm 5\% \hat{=}$ J upon request)

1) Replace the + by the code letter for the required capacitance tolerance.

Ordering codes and packing units

V_R (V_{rms} , $f \leq 60$ Hz)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code ¹⁾	Packing units (pcs) Untaped
400 Vdc (200 Vac)	22 nF	5,5 × 8,0 × 14,0	B32231-D6223-+	1500
	33 nF	5,5 × 8,0 × 14,0	B32231-D6333-+	1500
	47 nF	5,5 × 8,0 × 14,0	B32231-D6473-+	1500
	68 nF	5,5 × 8,5 × 14,0	B32231-D6683-+	1500
	0,10 μF	5,5 × 8,5 × 19,0	B32231-D6104-+	1500
	0,15 μF	5,5 × 9,0 × 19,0	B32231-D6154-+	1500
	0,22 μF	7,0 × 12,0 × 19,0	B32231-D6224-+	1000
	0,33 μF	7,0 × 12,0 × 19,0	B32231-D6334-+	1000
	0,47 μF	7,0 × 12,0 × 27,0	B32231-D6474-+	1000
	0,68 μF	8,0 × 14,0 × 27,0	B32231-D6684-+	1000
	1,0 μF	9,0 × 16,0 × 27,0	B32231-D6105-+	500
	1,5 μF	10,0 × 18,0 × 32,0	B32231-D6155-+	250
	2,2 μF	13,0 × 22,0 × 32,0	B32231-D6225-+	250
630 Vdc (200 Vac)	10 nF	5,5 × 8,0 × 14,0	B32231-D8103-+	1500
	15 nF	5,5 × 8,0 × 14,0	B32231-D8153-+	1500
	22 nF	5,5 × 8,0 × 14,0	B32231-D8223-+	1500
	33 nF	5,5 × 8,0 × 14,0	B32231-D8333-+	1500
	47 nF	6,0 × 9,0 × 14,0	B32231-D8473-+	1500
	68 nF	6,0 × 9,0 × 19,0	B32231-D8683-+	1000
	0,10 μF	6,0 × 11,0 × 19,0	B32231-D8104-+	1000
	0,15 μF	7,5 × 12,0 × 19,0	B32231-D8154-+	1000
	0,22 μF	8,0 × 13,0 × 19,0	B32231-D8224-+	1000
	0,33 μF	8,0 × 13,0 × 27,0	B32231-D8334-+	1000
	0,47 μF	8,0 × 14,0 × 27,0	B32231-D8474-+	1000
	0,68 μF	10,0 × 16,0 × 32,0	B32231-D8684-+	500
	1,0 μF	13,0 × 18,0 × 32,0	B32231-D8105-+	250

Capacitance tolerance: $\pm 20\% \hat{=}$ M, $\pm 10\% \hat{=}$ K, ($\pm 5\% \hat{=}$ J upon request)

1) Replace the + by the code letter for the required capacitance tolerance.

Technical data

Climatic category in accordance with IEC 68-1	40/100/21			
Lower category temperature T_{\min}	- 40 °C			
Upper category temperature T_{\max}	+ 100 °C			
Damp heat test	21 days/40 °C/93 % relative humidity			
Limit values after damp heat test	Capacitance change $ \Delta C/C \leq 5 \%$ Dissipation factor change $\Delta \tan \delta \leq 5 \cdot 10^{-3}$ (at 1 kHz) $\leq 7 \cdot 10^{-3}$ (at 10 kHz) Insulation resistance $R_{is} \geq 20 \%$ of minimum or time constant $\tau = C_R \cdot R_{is}$ as-delivered values			
DC test voltage	$1,4 \cdot V_R, 2 \text{ s}$			
Category voltage V_C	$T \leq 85 \text{ °C}: V_C = 1,0 \cdot V_R$ or $1,0 \cdot V_{rms}$			
Operation with dc voltage or ac voltage V_{rms} up to 60 Hz	$T \leq 100 \text{ °C}: V_C = 0,8 \cdot V_R$ or $0,8 \cdot V_{rms}$			
Category voltage for short operating periods	$T \leq 100 \text{ °C}: 1,25 \cdot V_R$ for max. 2000 h or $1,0 \cdot V_{rms}$ for max. 1000 h			
Dissipation factor $\tan \delta$ (in 10^{-3}) at 20 °C (upper limit values)		$C_R \leq 47 \text{ nF}$	$47 \text{ nF} < C_R \leq 1 \text{ }\mu\text{F}$	$C_R > 1 \text{ }\mu\text{F}$
	at 1 kHz	10	10	10
	10 kHz	20	25	—
Insulation resistance R_{is} or time constant $\tau = C_R \cdot R_{is}$ at 20 °C, rel. humidity $\leq 65 \%$ (minimum as-delivered values)	V_R	$C_R \leq 0,33 \text{ }\mu\text{F}$	$C_R > 0,33 \text{ }\mu\text{F}$	
	100 Vdc	3750 M Ω	1250 s	
	$\geq 250 \text{ Vdc}$	7500 M Ω	2500 s	
Impedance Z versus frequency f (typical values)				

Pulse handling capability

Maximum permissible voltage change per unit of time for non-sinusoidal voltages (pulse, sawtooth)

Rated voltage V_R	Max. rate of voltage rise V_{pp}/τ in $V/\mu s$ (for $V_{pp} = V_R$)			
	Length of capacitor			
	14 mm	19 mm	27,0 mm	32 mm
100 Vdc	6	3	2	1,5
250 Vdc	10	5	3	2,5
400 Vdc	14	7	4	3
630 Vdc	20	10	7	5

For $V_{pp} < V_R$, the permissible voltage rise rate value V_{pp}/τ may be multiplied by the factor V_R/V_{pp} . Also refer to the calculation example on [page 250](#).

Rated voltage V_R	Pulse characteristic k_0 in $V^2/\mu s$ (for $V_{pp} \leq V_R$)			
	Length of capacitor			
	14 mm	19 mm	27,0 mm	32 mm
100 Vdc	1 200	600	400	300
250 Vdc	5 000	2 500	1 500	1 250
400 Vdc	11 000	5 600	3 200	2 400
630 Vdc	25 000	12 500	8 800	6 300

Permissible ac voltage V_{rms} versus frequency f

Values can be obtained upon request. In specific cases please provide a scaled voltage/ time graph and state operating conditions.