



## Film Capacitors

### Metallized Polyester Film Capacitors (MKT)

**Series/Type:** B32231  
**Date:** August 2004

© EPCOS AG 2004. Reproduction, publication and dissemination of this data sheet, enclosures hereto and the information contained therein without EPCOS' prior express consent is prohibited.

Purchase orders are subject to the General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry recommended by the ZVEI (German Electrical and Electronic Manufacturers' Association), unless otherwise agreed.

**General purpose (wound)**
**Typical applications**

- Smoothing
- Filtering

**Climatic**

- Max. operating temperature: 100 °C
- Climatic category (IEC 60068-1): 40/100/21

**Construction**

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

**Terminals**

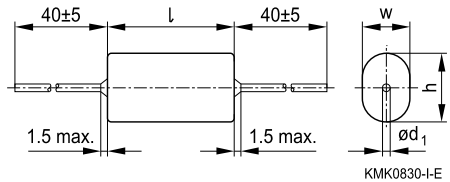
- Central axial wire leads, lead-free tinned

**Marking**

Manufacturer, series number, rated capacitance (coded), capacitance tolerance (code letter), rated DC voltage, date of manufacture (coded)

**Delivery mode**

Bulk (untaped)

**Dimensional drawing**


Dimensions in mm

Width $w_{\max}$	$\leq 6.0$	$> 6.0 \dots 13.0$
Lead 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	B32231			
$V_R$ (VDC)	100	250	400	630
$V_{rms}$ (VAC)	63	160	200	200
$C_R$ ( $\mu F$ )				
0.10				
0.15				
0.22				
0.33				
0.47				
0.68				
1.0				
1.5				
2.2				
3.3				
4.7				
6.8				
10				


**B32231**
**General purpose (wound)**
**Ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 60$ Hz	$C_R$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Untaped pcs./unit
VDC	VAC	$\mu F$			
100	63	0.15	5.5 × 8.5 × 14.0	B32231D1154+000	1500
		0.22	5.5 × 8.5 × 14.0	B32231D1224+000	1500
		0.33	5.5 × 8.5 × 14.0	B32231D1334+000	1500
		0.47	5.5 × 9.0 × 19.0	B32231D1474+000	1500
		0.68	5.5 × 9.0 × 19.0	B32231D1684+000	1500
		1.0	7.0 × 12.0 × 19.0	B32231D1105+000	1000
		1.5	8.0 × 13.0 × 19.0	B32231D1155+000	1000
		2.2	8.0 × 13.0 × 27.0	B32231D1225+000	1000
		3.3	8.0 × 15.0 × 27.0	B32231D1335+000	1000
		4.7	10.0 × 18.0 × 32.0	B32231D1475+000	500
		6.8	10.0 × 20.0 × 32.0	B32231D1685+000	500
		10	13.0 × 23.0 × 32.0	B32231D1106+000	250
250	160	0.10	5.5 × 8.5 × 14.0	B32231D3104+000	1500
		0.15	5.5 × 8.5 × 14.0	B32231D3154+000	1500
		0.22	5.5 × 9.0 × 19.0	B32231D3224+000	1500
		0.33	5.5 × 9.0 × 19.0	B32231D3334+000	1500
		0.47	6.0 × 12.0 × 19.0	B32231D3474+000	1000
		0.68	7.5 × 12.0 × 19.0	B32231D3684+000	1000
		1.0	7.5 × 12.0 × 27.0	B32231D3105+000	1000
		1.5	8.5 × 14.0 × 27.0	B32231D3155+000	1000
		2.2	8.5 × 16.0 × 27.0	B32231D3225+000	500
		3.3	10.0 × 18.0 × 32.0	B32231D3335+000	500
		4.7	13.0 × 20.0 × 32.0	B32231D3475+000	250

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5% (on request)

**Ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 60$ Hz VDC	$C_R$ $\mu F$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Untaped pcs./unit
400	200	0.10	$5.5 \times 8.5 \times 19.0$	B32231D6104+000	1500
		0.15	$5.5 \times 9.0 \times 19.0$	B32231D6154+000	1500
		0.22	$7.0 \times 12.0 \times 19.0$	B32231D6224+000	1000
		0.33	$7.0 \times 12.0 \times 19.0$	B32231D6334+000	1000
		0.47	$7.0 \times 12.0 \times 27.0$	B32231D6474+000	1000
		0.68	$8.0 \times 14.0 \times 27.0$	B32231D6684+000	1000
		1.0	$9.0 \times 16.0 \times 27.0$	B32231D6105+000	500
		1.5	$10.0 \times 18.0 \times 32.0$	B32231D6155+000	250
		2.2	$13.0 \times 22.0 \times 32.0$	B32231D6225+000	250
630	200	0.10	$6.0 \times 11.0 \times 19.0$	B32231D8104+000	1000
		0.15	$7.5 \times 12.0 \times 19.0$	B32231D8154+000	1000
		0.22	$8.0 \times 13.0 \times 19.0$	B32231D8224+000	1000
		0.33	$8.0 \times 13.0 \times 27.0$	B32231D8334+000	1000
		0.47	$8.0 \times 14.0 \times 27.0$	B32231D8474+000	500
		0.68	$10.0 \times 16.0 \times 32.0$	B32231D8684+000	500
		1.0	$13.0 \times 18.0 \times 32.0$	B32231D8105+000	250

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

M =  $\pm 20\%$

K =  $\pm 10\%$

J =  $\pm 5\%$  (on request)


**B32231**
**General purpose (wound)**
**Technical data**

Operating temperature range	Max. operating temperature $T_{op,max}$		+100 °C
	Upper category temperature $T_{max}$		+100 °C
	Lower category temperature $T_{min}$		-40 °C
	Rated temperature $T_R$		+85 °C
Dissipation factor $\tan \delta$ (in $10^{-3}$ ) at 20 °C (upper limit values)	at	$0.10 \mu\text{F} < C_R \leq 1 \mu\text{F}$	$C_R > 1 \mu\text{F}$
	1 kHz	10	10
	10 kHz	25	–
Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity $\leq 65\%$ (minimum as-delivered values)	$V_R$	$C_R \leq 0.33 \mu\text{F}$	$C_R > 0.33 \mu\text{F}$
	100 VDC	3750 M $\Omega$	1250 s
	$\geq 250$ VDC	7500 M $\Omega$	2500 s
DC test voltage	$1.4 \cdot V_R, 2 \text{ s}$		
Category voltage $V_C$ (continuous operation with $V_{DC}$ or $V_{AC}$ at $f \leq 60$ Hz)	$T_A$ (°C)	DC voltage derating	AC voltage derating
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_C = V_R$ $V_C = V_R \cdot (165 - T_A)/80$	$V_{C,rms} = V_{rms}$ $V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage $V_{op}$ for short operating periods ( $V_{DC}$ or $V_{AC}$ at $f \leq 60$ Hz)	$T_A$ (°C)	DC voltage (max. hours)	AC voltage (max. hours)
	$T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (2000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (1000 h)
Damp heat test Limit values after damp heat test	21 days/40 °C/93% relative humidity		
	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 $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$	$\geq 20\%$ of minimum as-delivered values	



### Pulse handling capability

"dV/dt" represents the maximum permissible voltage change per unit of time for non-sinusoidal voltages, expressed in V/ $\mu$ s.

"k<sub>0</sub>" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V<sup>2</sup>/ $\mu$ s.

*Note:*

*The values of dV/dt and k<sub>0</sub> provided below must not be exceeded in order to avoid damaging the capacitor.*

### dV/dt values

Length of capacitor		14 mm	19 mm	27 mm	32 mm
V <sub>R</sub> VDC	V <sub>rms</sub> VAC	dV/dt in V/ $\mu$ s			
100	63	6	3	2	1.5
250	160	10	5	3	2.5
400	200	–	7	4	3
630	200	–	10	7	5

### k<sub>0</sub> values

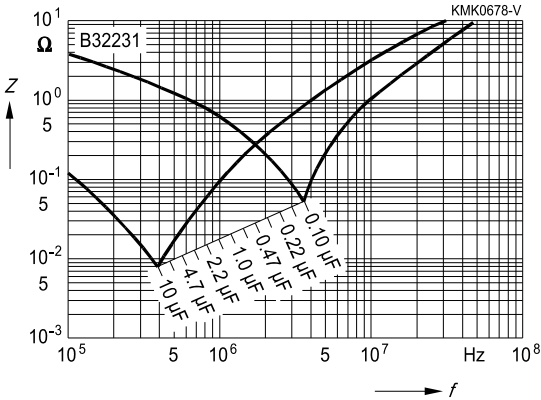
Length of capacitor		14 mm	19 mm	27 mm	32 mm
V <sub>R</sub> VDC	V <sub>rms</sub> VAC	k <sub>0</sub> in V <sup>2</sup> / $\mu$ s			
100	63	1 200	600	400	300
250	160	5 000	2 500	1 500	1 250
400	200	–	5 600	3 200	2 400
630	200	–	12 500	8 800	6 300



**B32231**

**General purpose (wound)**

**Impedance Z versus frequency f**  
(typical values)



**Permissible AC voltage  $V_{rms}$  versus frequency f**

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