

Axial Leads
**High-reliability capacitor
Insulating sleeve**
Construction

- Dielectric: polyethylene terephthalate
- Construction with structured metallization
- Tubular winding
- Insulating sleeve
- Face ends sealed with epoxy resin

Features

- Optimum self-healing capability
- Excellent short circuit protection
- Very high reliability

Typical applications

- As replacement for MKL capacitors
- High-rel circuits in industrial electronics

Terminals

- Central axial leads, tinned

Marking

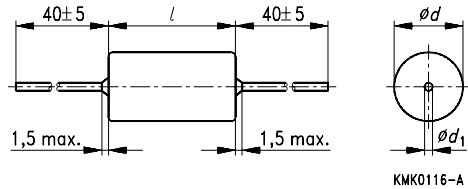
Manufacturer's logo,
design (MKT-S), rated capacitance,
capacitance tolerance,
rated voltage

Delivery mode

Bulk (untaped)

Taped (Ammo pack)

For notes on taping, [refer to chapter "Taping and packing", page 273.](#)



Dimensions in mm

Diameter d	< 7,8	7,8 ... 16	> 16
Diameter d_1	0,6	0,8	1,0

Selector guide

Type	B 32 538				
33 nF					630 Vdc
47 nF					
68 nF					
0,10 μ F	50 Vdc	100 Vdc	160 Vdc	250 Vdc	
0,15 μ F					
0,22 μ F					
0,33 μ F					
0,47 μ F					
0,68 μ F					
1,0 μ F					
1,5 μ F					
2,2 μ F					
3,3 μ F					
4,7 μ F					
6,8 μ F					
10 μ F					
22 μ F					
47 μ F					
100 μ F					

Ordering codes and packing units

V_R (V_{rms} , $f \leq 60$ Hz)	C_R	Dimensions (max.) $d \times l$ mm	Ordering code ¹⁾	Packing units (pcs)	
				Ammo pack	Untaped
50 Vdc (20 Vac)	0,47 μ F	6,1 \times 16,0	B32538-B5474-+***	1100	50
	0,68 μ F	6,3 \times 16,0	B32538-B5684-+***	1000	50
	1,0 μ F	6,9 \times 16,0	B32538-B5105-+***	950	50
	1,5 μ F	7,6 \times 16,0	B32538-B5155-+***	870	50
	2,2 μ F	7,4 \times 20,0	B32538-B5225-+***	900	50
	3,3 μ F	8,2 \times 20,0	B32538-B5335-+***	800	50
	4,7 μ F	9,3 \times 20,0	B32538-B5475-+***	700	20
	6,8 μ F	10,8 \times 20,0	B32538-B5685-+***	400	20
	10 μ F	12,6 \times 20,0	B32538-B5106-+***	350	20
100 Vdc (35 Vac)	0,10 μ F	6,2 \times 16,0	B32538-B1104-+***	1000	50
	0,15 μ F	6,4 \times 16,0	B32538-B1154-+***	1000	50
	0,22 μ F	6,9 \times 16,0	B32538-B1224-+***	950	50
	0,33 μ F	7,0 \times 16,0	B32538-B1334-+***	950	50
	0,47 μ F	6,7 \times 16,0	B32538-B1474-+***	950	50
	0,68 μ F	6,7 \times 16,0	B32538-B1684-+***	950	50
	1,0 μ F	6,7 \times 20,0	B32538-B1105-+***	950	50
	1,5 μ F	7,4 \times 20,0	B32538-B1155-+***	900	50
	2,2 μ F	8,0 \times 20,0	B32538-B1225-+***	800	50
	3,3 μ F	9,2 \times 20,0	B32538-B1335-+***	700	20
	4,7 μ F	10,4 \times 20,0	B32538-B1475-+***	400	20
	6,8 μ F	9,0 \times 32,5	B32538-B1685-+***	700	20
	10 μ F	10,7 \times 32,5	B32538-B1106-+***	400	20
	22 μ F	14,6 \times 32,5	B32538-B1226-+***	PU upon request	20
47 μ F	20,2 \times 32,5	B32538-B1476-+***	PU upon request	20	
100 μ F	28,2 \times 32,5	B32538-B1107-+***	PU upon request	20	
160 Vdc (60 Vac)	0,10 μ F	6,1 \times 16,0	B32538-B2104-+***	1100	50
	0,15 μ F	6,2 \times 16,0	B32538-B2154-+***	1000	50
	0,22 μ F	6,4 \times 16,0	B32538-B2224-+***	1000	50
	0,33 μ F	7,0 \times 16,0	B32538-B2334-+***	950	50
	0,47 μ F	6,9 \times 20,0	B32538-B2474-+***	950	50
	0,68 μ F	7,5 \times 20,0	B32538-B2684-+***	870	50
	1,0 μ F	8,3 \times 20,0	B32538-B2105-+***	800	50
	1,5 μ F	10,5 \times 20,0	B32538-B2155-+***	400	20

 Capacitance tolerance: $\pm 20\% \cong M$, $\pm 10\% \cong K$, $\pm 5\% \cong J$

1) + Code letter for capacitance tolerance

*** Code number for packing: Ammo pack = 007

The ordering code for untaped components ends after the tolerance code letter.

Ordering codes and packing units

V_R (V_{rms} , $f \leq 60$ Hz)	C_R	Dimensions (max.) $d \times l$ mm	Ordering code ¹⁾	Packing units (pcs)	
				Ammo pack	Untaped
160 Vdc (60 Vac)	2,2 μ F	11,0 \times 20,0	B32538-B2225-+***	400	20
	3,3 μ F	10,0 \times 32,5	B32538-B2335-+***	450	20
	4,7 μ F	11,3 \times 32,5	B32538-B2475-+***	380	20
	6,8 μ F	13,1 \times 32,5	B32538-B2685-+***	PU upon request	20
	10 μ F	15,3 \times 32,5	B32538-B2106-+***	PU upon request	20
250 Vdc (90 Vac)	0,10 μ F	6,7 \times 16,0	B32538-B3104-+***	950	50
	0,15 μ F	7,2 \times 16,0	B32538-B3154-+***	900	50
	0,22 μ F	7,3 \times 16,0	B32538-B3224-+***	900	50
	0,33 μ F	7,3 \times 20,0	B32538-B3334-+***	900	50
	0,47 μ F	8,0 \times 20,0	B32538-B3474-+***	800	50
	0,68 μ F	9,0 \times 20,0	B32538-B3684-+***	700	20
	1,0 μ F	10,3 \times 20,0	B32538-B3105-+***	400	20
	1,5 μ F	12,0 \times 20,0	B32538-B3155-+***	380	20
	2,2 μ F	14,0 \times 20,0	B32538-B3225-+***	300	20
	3,3 μ F	12,6 \times 32,5	B32538-B3335-+***	350	20
	4,7 μ F	14,5 \times 32,5	B32538-B3475-+***	PU upon request	20
6,8 μ F	17,0 \times 32,5	B32538-B3685-+***	PU upon request	20	
10 μ F	20,1 \times 32,5	B32538-B3106-+***	–	20	
630 Vdc (200 Vac)	33 nF	6,7 \times 16,0	B32538-B8333-+***	950	50
	47 nF	7,3 \times 16,0	B32538-B8473-+***	900	50
	68 nF	7,2 \times 20,0	B32538-B8683-+***	900	50
	0,10 μ F	7,9 \times 20,0	B32538-B8104-+***	800	50
	0,15 μ F	9,0 \times 20,0	B32538-B8154-+***	700	20
	0,22 μ F	10,5 \times 20,0	B32538-B8224-+***	400	20
	0,33 μ F	12,0 \times 20,0	B32538-B8334-+***	380	20
	0,47 μ F	13,9 \times 20,0	B32538-B8474-+***	300	20
	0,68 μ F	12,3 \times 32,5	B32538-B8684-+***	350	20
	1,0 μ F	14,3 \times 32,5	B32538-B8105-+***	PU upon request	20
	1,5 μ F	17,0 \times 32,5	B32538-B8155-+***	PU upon request	20
	2,2 μ F	20,0 \times 32,5	B32538-B8225-+***	–	20
	3,3 μ F	23,9 \times 32,5	B32538-B8335-+***	–	20
4,7 μ F	28,1 \times 32,5	B32538-B8475-+***	–	20	

 Capacitance tolerance: $\pm 20\% \approx M$, $\pm 10\% \approx K$, $\pm 5\% \approx J$

1) + Code letter for capacitance tolerance

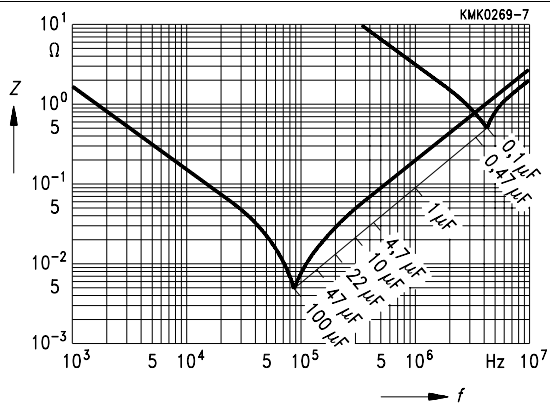
*** Code number for packing: Ammo pack = 007

The ordering code for untaped components ends after the tolerance code letter.

Technical data

Climatic category in acc. with DIN IEC 60068-1	55/100/56				
Lower category temperature T_{\min}	-55 °C				
Upper category temperature T_{\max}	+100 °C				
Damp heat test	56 days/40 °C/93 % r.h.				
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)		
	Insulation resistance R_{is}		$\geq 50 \%$ of minimum as-delivered value		
Reliability:					
Reference conditions	0,5 · V_R ; 40 °C				
Failure rate	1 · 10 ⁻⁹ /h = 1 fit				
	For a conversion table for other operating conditions and temperatures, refer to chapter "Quality assurance", page 327.				
Failure criteria:					
Total failure	Short or open circuit				
Failure due to variations	Capacitance change $ \Delta C/C $		$> 10 \%$		
	Dissipation factor $\tan \delta$		$> 1,5 \cdot$ upper category val.		
	Insulation resistance R_{is}		$< 150 \text{ M}\Omega$ ($\leq 0,33 \mu\text{F}$)		
	or time constant $\tau = C_R \cdot R_{is}$		$< 50 \text{ s}$ ($> 0,33 \mu\text{F}$)		
DC test voltage	1,4 · V_R , 2 s				
Category voltage V_C	$T \leq 85 \text{ }^\circ\text{C}$	$V_C = 1,0 \cdot V_R$	$V_{C,rms} = 1,0 \cdot V_{rms}$		
Operation with dc voltage or ac voltage V_{rms} up to 60 Hz	$T \leq 100 \text{ }^\circ\text{C}$	$V_C = 0,8 \cdot V_R$	$V_{C,rms} = 0,8 \cdot V_{rms}$		
Operating voltage for short operating periods	$T \leq 85 \text{ }^\circ\text{C}$	$V = 1,25 \cdot V_C$, max. 2000 h	$V = 1,0 \cdot V_{C,rms}$, max. 2000 h		
	$T \leq 100 \text{ }^\circ\text{C}$	$V = 1,25 \cdot V_C$, max. 2000 h	$V = 1,0 \cdot V_{C,rms}$, max. 2000 h		
	$T \leq 125 \text{ }^\circ\text{C}$	$V = 0,5 \cdot V_R$, max. 1000 h	$V = 0,5 \cdot V_{rms}$, max. 1000 h		
Dissipation factor $\tan \delta$ (in 10 ⁻³) measured at 20 °C (upper category values)	C_R (μF)	$\leq 0,47$	$0,47 < C_R \leq 4,7$	$4,7 < C_R \leq 10,0$	> 10
	at 1 kHz	7	8	8	10
	10 kHz	15	22	25	—
Insulation resistance R_{is} or time constant $\tau = C_R \cdot R_{is}$ measured at 20 °C and at a relative humidity $\leq 65 \%$ (minimum as-delivered values)	C_R				
	$\leq 0,33 \mu\text{F}$	$> 15000 \text{ M}\Omega$			
	$> 0,33 \mu\text{F}$	$> 5000 \text{ s}$			

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		
	16 mm	20 mm	32,5 mm
50 Vdc	2,5	1,5	—
100 Vdc	13	9	6
160 Vdc	20	12	8
250 Vdc	23	16	10
630 Vdc	40	26	18

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 in chapter "General technical information", page 302.

Rated voltage V_R	Pulse characteristic k_0 in $V^2/\mu s$ (for $V_{pp} \leq V_R$)		
	Length of capacitor		
	16 mm	20 mm	32,5 mm
50 Vdc	250	150	—
100 Vdc	2600	1800	1200
160 Vdc	6400	3840	2560
250 Vdc	11500	8000	5000
630 Vdc	50400	32800	22700

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.

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