Film Capacitors

Metallized Polyester Film Capacitors (MKT)

Series/Type: **B32559**

Date: June 2007

Typical applications
- Energy saving lamps
- ADSL

Climatic
- Max. operating temperature: 125 °C
- Climatic category (IEC 60068-1): 55/125/56

Construction
- Dielectric: polyethylene terephthalate (polyester, PET)
- Stacked-film technology
- Heat shrinkable tube (polyester 100 µm, 125 °C)

Features
- Very small dimensions
- Self-healing properties
- High pulse strength

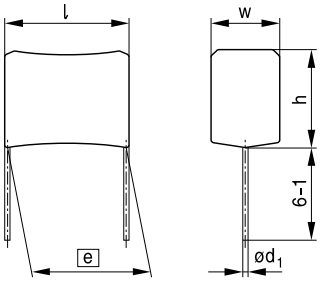
Terminals
- Lead spacing 5.0 mm
- Crimped wire leads, lead-free tinned, lead length (6 −1) mm
- Straight wire leads, lead-free tinned, lead length (6 −1) mm
- Special lead length available on request

Marking
Manufacturer's logo,
rated capacitance (coded),
capacitance tolerance (code letter),
rated AC voltage,
date of manufacture (coded)

Delivery mode
Bulk (untaped)
Taped (Ammo pack or reel)
For notes on taping, refer to chapter "Taping and packing".

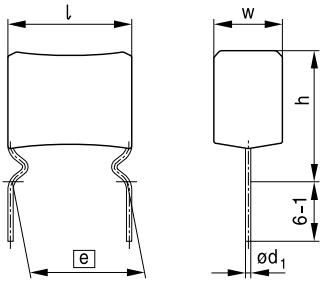
Detail specifications
Homologated to IEC 60384-2

Dimensional drawing
Straight leads



KMK1132-9-E

Crimped leads



KMK1104-9-E

Dimensions in mm

Lead spacing e ±0.4	Lead diameter d_1
5.0	0.5

Overview of available types

Lead spacing	5.0 mm					5.0 mm				
Type	B32559					B32559				
Configuration	straight leads					crimped leads				
Page	4					6				
V_R (V DC)	63	100	250	400	630	63	100	250	400	630
V_{rms} (V AC)	40	63	160	200	400	40	63	160	200	400
C_R (µF)										
0.0010										
0.0015										
0.0022										
0.0033										
0.0047										
0.0068										
0.010										
0.015										
0.022										
0.033										
0.047										
0.068										
0.10										
0.15										
0.22										
0.33										
0.47										
0.68										
1.0										

Ordering codes and packing units (straight leads)

V_R	V_{rms} f ≤60 Hz	C_R	Max. dimensions (straight leads) w × h × l	Ordering code (composition see below)	Ammo pack	Reel	Untaped
V DC	V AC	µF	mm		pcs./unit	pcs./unit	pcs./unit
63	40	0.22	3.0 x 6.5 x 7.0	B32559C0224+***	2700	2300	2500
		0.33	3.0 x 6.5 x 7.0	B32559C0334+***	2700	2300	2500
		0.47	3.5 x 6.5 x 7.0	B32559C0474+***	2300	1900	2500
		0.68	3.5 x 8.5 x 7.0	B32559C0684+***	2300	1900	2000
		1.0	4.0 x 9.0 x 7.0	B32559C0105+***	2100	1700	1500
100	63	0.015	2.5 x 6.5 x 7.0	B32559C1153+***	3200	2800	3000
		0.022	2.5 x 6.5 x 7.0	B32559C1223+***	3200	2800	3000
		0.033	2.5 x 6.5 x 7.0	B32559C1333+***	3200	2800	3000
		0.047	2.5 x 6.5 x 7.0	B32559C1473+***	3200	2800	3000
		0.068	2.5 x 6.5 x 7.0	B32559C1683+***	3200	2800	3000
		0.10	2.5 x 6.5 x 7.0	B32559C1104+***	3200	2800	3000
		0.15	2.5 x 6.5 x 7.0	B32559C1154+***	3200	2800	3000
250	160	0.022	2.5 x 6.5 x 7.0	B32559C3223+***	3200	2800	3000
		0.033	2.5 x 6.5 x 7.0	B32559C3333+***	3200	2800	3000
		0.047	2.5 x 6.5 x 7.0	B32559C3473+***	3200	2800	3000
		0.068	3.0 x 7.0 x 7.0	B32559C3683+***	2700	2300	2500
		0.10	3.5 x 8.5 x 7.0	B32559C3104+***	2300	1900	2000
400	200	0.010	2.5 x 6.5 x 7.0	B32559C6103+***	3200	2800	3000
		0.015	2.5 x 6.5 x 7.0	B32559C6153+***	3200	2800	3000
		0.022	2.5 x 6.5 x 7.0	B32559C6223+***	3200	2800	3000
		0.033	3.0 x 7.0 x 7.0	B32559C6333+***	2700	2300	2500
		0.047	3.5 x 7.0 x 7.0	B32559C6473+***	2300	1900	2500
		0.068	4.5 x 8.0 x 7.0	B32559C6683+***	1900	1500	1500
		0.10	5.5 x 10.0 x 7.0	B32559C6104+***	1500	1200	1000

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:
- M = ±20%
- K = ±10%
- J = ±5%

*** = Packaging code:
- 489 = Ammo pack
- 389 = Reel
- 001 = Untaped (lead length 6 −1 mm)

V_R	V_{rms} f ≤60 Hz	C_R	Max. dimensions (straight leads) w × h × l	Ordering code (composition see below)	Ammo pack	Reel	Untaped
V DC	V AC	µF	mm		pcs./unit	pcs./unit	pcs./unit
630	400	0.0010	3.0 x 7.0 x 7.0	B32559C8102+***	2700	2300	2500
		0.0015	3.0 x 7.0 x 7.0	B32559C8152+***	2700	2300	2500
		0.0022	3.0 x 7.0 x 7.0	B32559C8222+***	2700	2300	2500
		0.0033	3.5 x 7.5 x 7.0	B32559C8332+***	2300	1900	2500
		0.0047	3.5 x 8.0 x 7.0	B32559C8472+***	2300	1900	2000
		0.0068	3.5 x 8.0 x 7.0	B32559C8682+***	2300	1900	2000
		0.010	3.5 x 8.0 x 7.0	B32559C8103+***	2300	1900	2000
		0.015	3.5 x 9.5 x 7.0	B32559C8153+***	2300	1900	1500

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:
- M = ±20%
- K = ±10%
- J = ±5%

*** = Packaging code:
- 489 = Ammo pack
- 389 = Reel
- 001 = Untaped (lead length 6 −1 mm)

Ordering codes and packing units (crimped leads)

V_R	V_{rms} f ≤60 Hz	C_R	Max. dimensions (crimped leads) w × h × l	Ordering code (composition see below)	Ammo pack	Reel	Untaped
V DC	V AC	µF	mm		pcs./unit	pcs./unit	pcs./unit
63	40	0.22	3.0 × 10.0 × 7.0	B32559C0224+***	2700	2300	2500
		0.33	3.0 × 10.0 × 7.0	B32559C0334+***	2700	2300	2500
		0.47	3.5 × 10.0 × 7.0	B32559C0474+***	2300	1900	2500
		0.68	3.5 × 12.0 × 7.0	B32559C0684+***	2300	1900	2000
100	63	0.015	2.5 × 10.0 × 7.0	B32559C1153+***	3200	2800	3000
		0.022	2.5 × 10.0 × 7.0	B32559C1223+***	3200	2800	3000
		0.033	2.5 × 10.0 × 7.0	B32559C1333+***	3200	2800	3000
		0.047	2.5 × 10.0 × 7.0	B32559C1473+***	3200	2800	3000
		0.068	2.5 × 10.0 × 7.0	B32559C1683+***	3200	2800	3000
		0.10	2.5 × 10.0 × 7.0	B32559C1104+***	3200	2800	3000
		0.15	2.5 × 10.0 × 7.0	B32559C1154+***	3200	2800	3000
250	160	0.022	2.5 × 9.5 × 7.0	B32559C3223+***	3200	2800	3000
		0.033	2.5 × 10.0 × 7.0	B32559C3333+***	3200	2800	3000
		0.047	2.5 × 10.0 × 7.0	B32559C3473+***	3200	2800	3000
		0.068	3.0 × 10.5 × 7.0	B32559C3683+***	2700	2300	2500
		0.10	3.5 × 12.0 × 7.0	B32559C3104+***	2300	1900	2000
400	200	0.010	2.5 × 10.0 × 7.0	B32559C6103+***	3200	2800	3000
		0.015	2.5 × 10.0 × 7.0	B32559C6153+***	3200	2800	3000
		0.022	2.5 × 10.0 × 7.0	B32559C6223+***	3200	2800	3000
		0.033	3.0 × 10.5 × 7.0	B32559C6333+***	2700	2300	2500
		0.047	3.5 × 10.5 × 7.0	B32559C6473+***	2300	1900	2500
630	400	0.0010	3.0 × 10.5 × 7.0	B32559C8102+***	2700	2300	2500
		0.0015	3.0 × 10.5 × 7.0	B32559C8152+***	2700	2300	2500
		0.0022	3.0 × 10.5 × 7.0	B32559C8222+***	2700	2300	2500
		0.0033	3.5 × 11.0 × 7.0	B32559C8332+***	2300	1900	2000
		0.0047	3.5 × 11.5 × 7.0	B32559C8472+***	2300	1900	2000
		0.0068	3.5 × 11.5 × 7.0	B32559C8682+***	2300	1900	2000
		0.010	3.5 × 11.5 × 7.0	B32559C8103+***	2300	1900	2000

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:
M = ±20%
K = ±10%
J = ±5%

*** = Packaging code:
289 = Ammo pack
189 = Reel
000 = Untaped crimped (lead length 6 −1 mm)

Technical data

Operating temperature range	Max. operating temperature $T_{op,max}$		+125 °C
	Upper category temperature T_{max}		+125 °C
	Lower category temperature T_{min}		−55 °C
	Rated temperature T_R		+85 °C
Dissipation factor tan δ (in 10^{-3})	at	$C_R \leq 0.1$ µF	0.1 µF < $C_R \leq 1$ µF
at 20 °C	1 kHz	8	10
(upper limit values)	10 kHz	15	20
	100 kHz	30	–
Insulation resistance R_{ins}	V_R	$C_R \leq 0.33$ µF	$C_R > 0.33$ µF
or time constant $\tau = C_R \cdot R_{ins}$	≤ 100 V DC	3750 MΩ	1250 s
at 20 °C, rel. humidity ≤ 65%	≥ 250 V DC	7500 MΩ	2500 s
(minimum as-delivered values)			
DC test voltage	1.4 · V_R, 2 s		
Category voltage V_C	T_A (°C)	DC voltage derating	AC voltage derating
(continuous operation with V_{DC}	$T_A \leq 85$	$V_C = V_R$	$V_{C,rms} = V_{rms}$
or V_{AC} at f ≤ 60 Hz)	$85 < T_A \leq 125$	$V_C = V_R \cdot (165 - T_A)/80$	$V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage V_{op} for	T_A (°C)	DC voltage (max. hours)	AC voltage (max. hours)
short operating periods	$T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (2000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h)
(V_{DC} or V_{AC} at f ≤ 60 Hz)	$100 < T_A \leq 125$	$V_{op} = 1.25 \cdot V_C$ (1000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (1000 h)
Damp heat test	56 days/40 °C/93% relative humidity		
Limit values after damp	Capacitance change $\lvert\Delta C/C\rvert$		≤ 5%
heat test	Dissipation factor change Δtan δ		≤ 5 · 10^{-3} (at 1 kHz)
	Insulation resistance R_{ins}		≥ 50% of minimum
	or time constant $\tau = C_R \cdot R_{ins}$		as-delivered values
Reliability:			
Failure rate λ	1 fit (≤ 1 · 10^{-9}/h) at 0.5 · V_R, 40 °C		
Service life t_{SL}	200 000 h at 1.0 · V_R, 40 °C		
	For conversion to other operating conditions and temperatures, refer to chapter "Quality assurance", page .		
Failure criteria:			
Total failure	Short circuit or open circuit		
Failure due to variation	Capacitance change $\lvert\Delta C/C\rvert$		> 10%
of parameters	Dissipation factor tan δ		> 2 · upper limit value
	Insulation resistance R_{ins}		< 150 MΩ ($C_R \leq 0.33$ µF)
	or time constant $\tau = C_R \cdot R_{ins}$		< 50 s ($C_R > 0.33$ µF)
Soldering conditions	Maximum solder bath temperature		245 °C
	Maximum soldering time		4 s

Pulse handling capability

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

"k_0" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in $V^2/\mu s$.

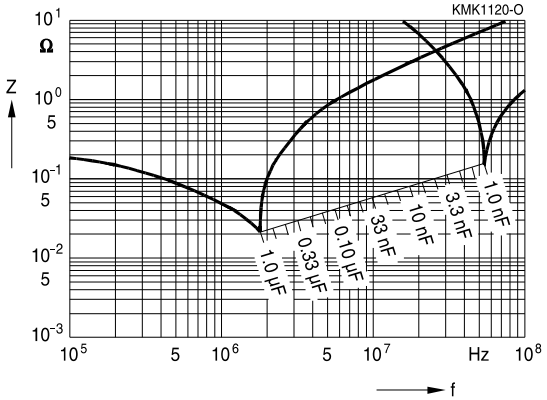
Note:
The values of dV/dt and k_0 provided below must not be exceeded in order to avoid damaging the capacitor.

dV/dt and k_0 values

V_R (V DC)	V_{rms} (V AC)	dV/dt in V/µs	k_0 in $V^2/\mu s$
63	40	250	30 000
100	63	300	60 000
250	160	400	200 000
400	200	600	500 000
630	400	800	1 000 000

Impedance Z versus frequency f

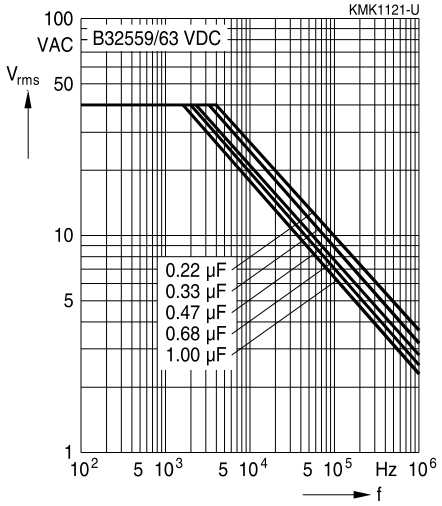
(typical values)



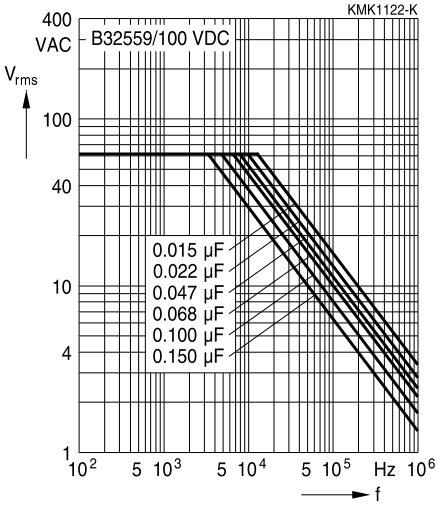
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 55$ °C)
For T_A >55 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 5 mm

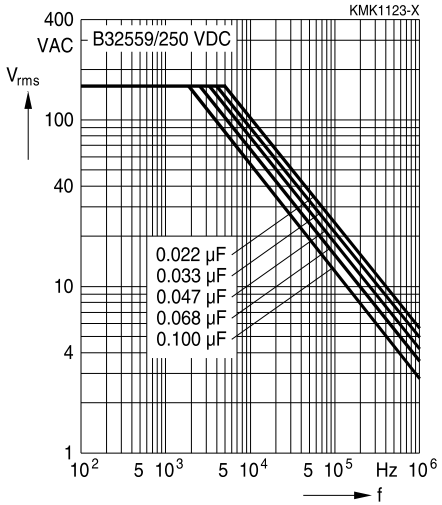
63 V DC/40 V AC



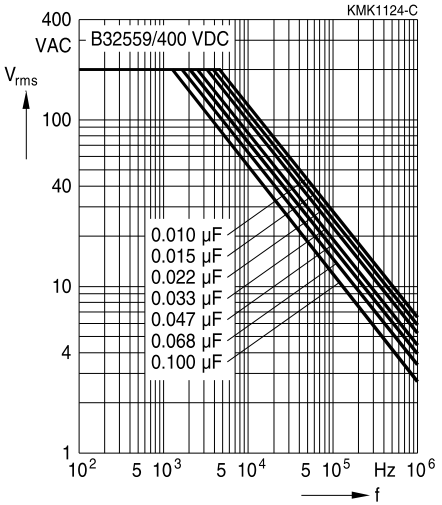
100 V DC/63 V AC



250 V DC/160 V AC



400 V DC/200 V AC

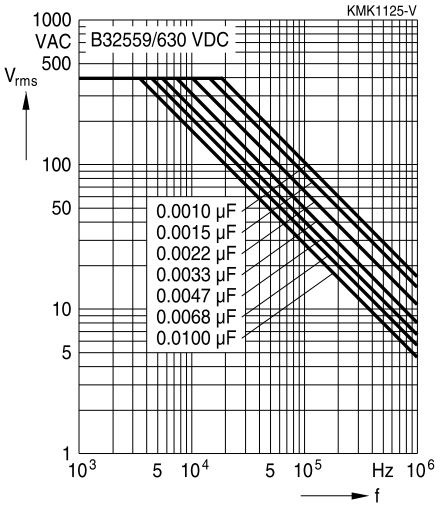


Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 55$ °C)

For T_A >55 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 5 mm

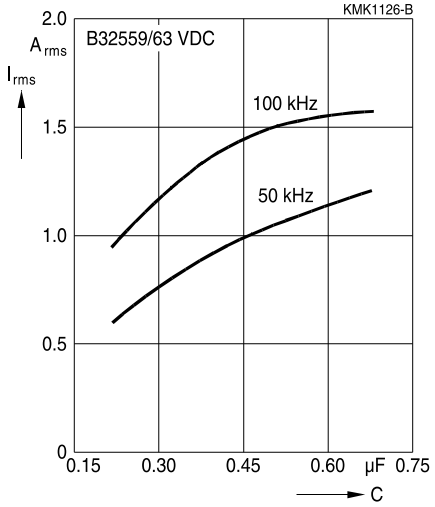
630 V DC/400 V AC



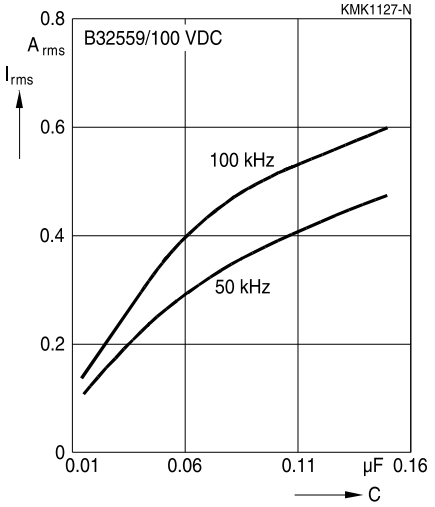
Permissible AC current I_{rms} versus frequency f

Lead spacing 5 mm

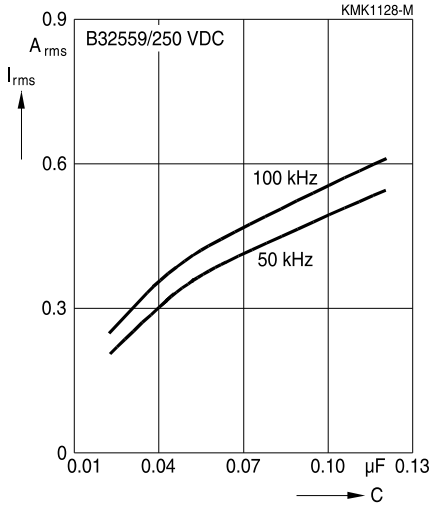
63 V DC/40 V AC



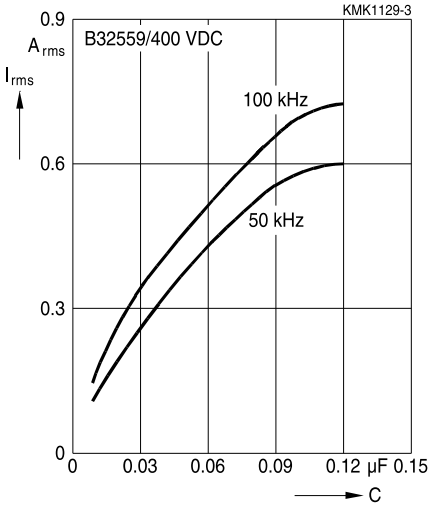
100 V DC/63 V AC



250 V DC/160 V AC



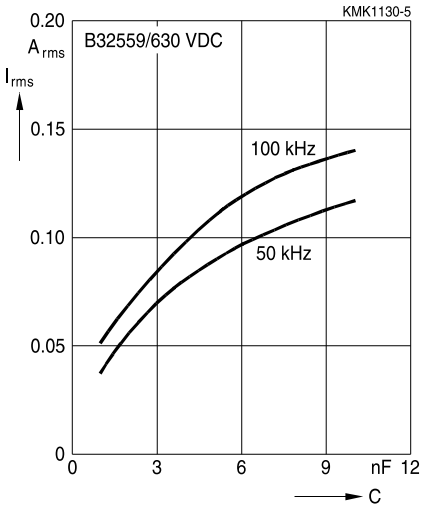
400 V DC/200 V AC



Permissible AC current I_{rms} versus frequency f

Lead spacing 5 mm

630 V DC/400 V AC



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