



Film Capacitors

Metallized Polypropylene Film Capacitors (MFP)

Series/Type: B32686S
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.

Snubbing (wound)
Typical applications

- Snubbing
- Filtering
- IGBT

Climatic

- Max. operating temperature: 100 °C
- Climatic category (IEC 60068-1): 55/100/56

Construction

- Dielectric: polypropylene (PP)
- Film metallized on one side and metal foils internally connected in series
- Plastic case, epoxy resin sealing (UL 94 V-0)

Features

- Very high pulse strength
- High current
- Highest possible contact reliability

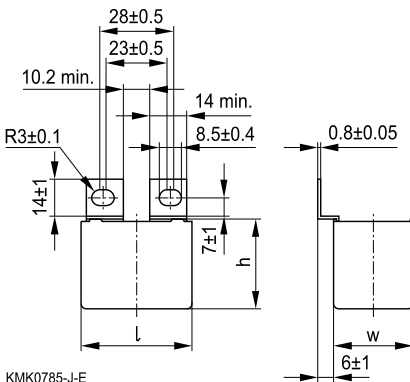
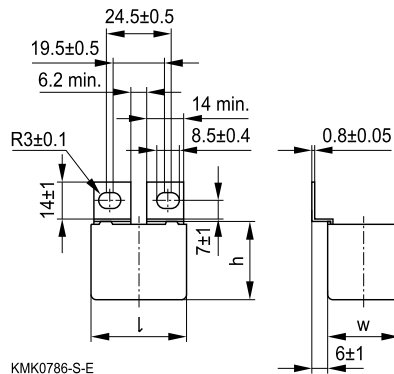
Terminals

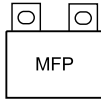
- Strap terminals, tinned copper (max. torque 10 Nm)

Marking

Manufacturer's logo, ordering code, style (MFP) rated capacitance (coded), cap. tolerance (code letter), rated DC voltage, date of manufacture (coded)

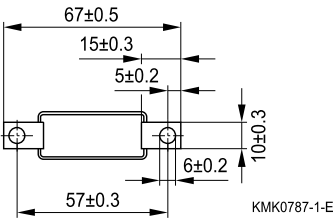
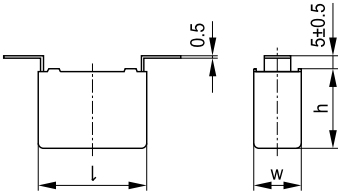
Delivery mode: Bulk

Dimensional drawings
T1 (code no. 561)

T2 (code no. 562)


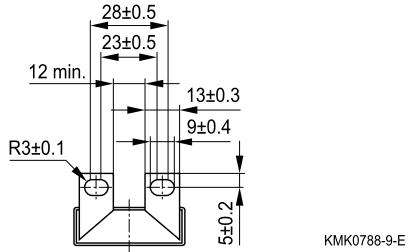
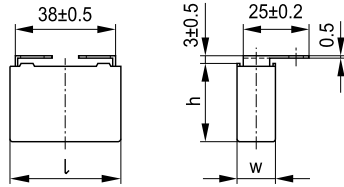


Dimensional drawings (continued)

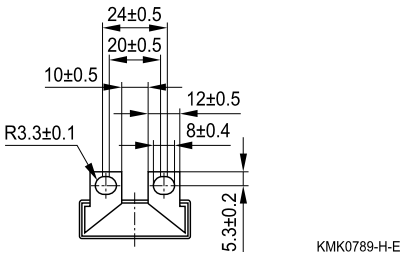
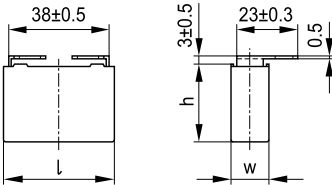
T3 (code no. 563)



T4 (code no. 564)



T5 (code no. 565)





B32686S

Snubbing (wound)

Overview of available types

Type	B32686S			
V_R (VDC)	1000	1250	1600	2000
V_{rms} (VAC)	400	450	450	500
C_R (nF)				
22				
33				
47				
68				
100				
120				
150				
220				
270				
330				
390				
470				
560				
680				

Electrical specifications, ordering codes and packing units

V_R	V_{rms} $f \leq 1\text{kHz}$	C_R	Max. dimensions $w \times h \times l$	I_{rms} 100 kHz	ESR 100 kHz	Ordering code (composition see below)	Ter- minal	pcs./ unit
VDC	VAC	nF	mm	A	m Ω			
1000	400	68	12.0 × 22.5 × 42.0	4.0	20	B32686S0683+563	T3	56
		68	12.0 × 22.5 × 42.0	4.0	20	B32686S0683+564	T4	96
		100	12.0 × 22.5 × 42.0	4.5	15	B32686S0104+563	T3	56
		100	12.0 × 22.5 × 42.0	4.5	15	B32686S0104+564	T4	96
		120	12.0 × 22.5 × 42.0	4.5	13	B32686S0124+563	T3	56
		120	12.0 × 22.5 × 42.0	4.5	13	B32686S0124+564	T4	96
		150	14.0 × 25.0 × 42.0	5.5	10	B32686S0154+563	T3	48
		150	14.0 × 25.0 × 42.0	5.5	10	B32686S0154+564	T4	72
		150	14.0 × 25.0 × 42.0	5.5	10	B32686S0154+565	T5	72
		220	16.0 × 28.5 × 42.0	7.0	7	B32686S0224+563	T3	40
		220	16.0 × 28.5 × 42.0	7.0	7	B32686S0224+564	T4	48
		220	16.0 × 28.5 × 42.0	7.0	7	B32686S0224+565	T5	48
		270	18.0 × 32.5 × 42.0	7.5	7	B32686S0274+563	T3	36
		270	18.0 × 32.5 × 42.0	7.5	7	B32686S0274+564	T4	32
		270	18.0 × 32.5 × 42.0	7.5	7	B32686S0274+565	T5	32
		330	20.0 × 39.5 × 42.0	8.5	5	B32686S0334+561	T1	24
		330	20.0 × 39.5 × 42.0	8.5	5	B32686S0334+562	T2	24
		330	20.0 × 39.5 × 42.0	8.5	5	B32686S0334+563	T3	26
		330	20.0 × 39.5 × 42.0	8.5	5	B32686S0334+564	T4	24
		330	20.0 × 39.5 × 42.0	8.5	5	B32686S0334+565	T5	24
		390	20.0 × 39.5 × 42.0	9.0	5	B32686S0394+561	T1	24
		390	20.0 × 39.5 × 42.0	9.0	5	B32686S0394+562	T2	24
		390	20.0 × 39.5 × 42.0	9.0	5	B32686S0394+563	T3	26
		390	20.0 × 39.5 × 42.0	9.0	5	B32686S0394+564	T4	24
		390	20.0 × 39.5 × 42.0	9.0	5	B32686S0394+565	T5	24
		470	28.0 × 37.0 × 42.0	10.0	3	B32686S0474+561	T1	27
		470	28.0 × 37.0 × 42.0	10.0	3	B32686S0474+562	T2	27
		470	28.0 × 37.0 × 42.0	10.0	3	B32686S0474+563	T3	18
		560	28.0 × 37.0 × 42.0	11.0	3	B32686S0564+561	T1	27
		560	28.0 × 37.0 × 42.0	11.0	3	B32686S0564+562	T2	27
		560	28.0 × 37.0 × 42.0	11.0	3	B32686S0564+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5%


B32686S
Snubbing (wound)
Electrical specifications, ordering codes and packing units

V_R	V_{rms} $f \leq 1\text{kHz}$ VAC	C_R nF	Max. dimensions $w \times h \times l$ mm	I_{rms} 100 kHz A	ESR 100 kHz m Ω	Ordering code (composition see below)	Ter- minal	pcs./ unit
1000	400	680	30.0 × 45.0 × 42.0	12.0	3	B32686S0684+561	T1	12
		680	30.0 × 45.0 × 42.0	12.0	3	B32686S0684+562	T2	12
		680	30.0 × 45.0 × 42.0	12.0	3	B32686S0684+563	T3	18
1250	450	68	12.0 × 22.5 × 42.0	4.5	20	B32686S7683+563	T3	56
		68	12.0 × 22.5 × 42.0	4.5	20	B32686S7683+564	T4	96
		100	14.0 × 25.0 × 42.0	5.0	15	B32686S7104+563	T3	48
		100	14.0 × 25.0 × 42.0	5.0	15	B32686S7104+564	T4	72
		100	14.0 × 25.0 × 42.0	5.0	15	B32686S7104+565	T5	72
		120	14.0 × 25.0 × 42.0	5.5	13	B32686S7124+563	T3	48
		120	14.0 × 25.0 × 42.0	5.5	13	B32686S7124+564	T4	72
		120	14.0 × 25.0 × 42.0	5.5	13	B32686S7124+565	T5	72
		150	16.0 × 28.5 × 42.0	6.5	10	B32686S7154+563	T3	40
		150	16.0 × 28.5 × 42.0	6.5	10	B32686S7154+564	T4	48
		150	16.0 × 28.5 × 42.0	6.5	10	B32686S7154+565	T5	48
		220	18.0 × 32.5 × 42.0	8.5	7	B32686S7224+563	T3	36
		220	18.0 × 32.5 × 42.0	8.5	7	B32686S7224+564	T4	32
		220	18.0 × 32.5 × 42.0	8.5	7	B32686S7224+565	T5	32
		270	20.0 × 39.5 × 42.0	9.0	7	B32686S7274+561	T1	24
		270	20.0 × 39.5 × 42.0	9.0	7	B32686S7274+562	T2	24
		270	20.0 × 39.5 × 42.0	9.0	7	B32686S7274+563	T3	26
		270	20.0 × 39.5 × 42.0	9.0	7	B32686S7274+564	T4	24
		270	20.0 × 39.5 × 42.0	9.0	7	B32686S7274+565	T5	24
		330	28.0 × 37.0 × 42.0	10.0	5	B32686S7334+561	T1	27
		330	28.0 × 37.0 × 42.0	10.0	5	B32686S7334+562	T2	27
		330	28.0 × 37.0 × 42.0	10.0	5	B32686S7334+563	T3	18
		390	28.0 × 37.0 × 42.0	11.0	5	B32686S7394+561	T1	27
		390	28.0 × 37.0 × 42.0	11.0	5	B32686S7394+562	T2	27
		390	28.0 × 37.0 × 42.0	11.0	5	B32686S7394+563	T3	18
		470	30.0 × 45.0 × 42.0	12.0	5	B32686S7474+561	T1	12
		470	30.0 × 45.0 × 42.0	12.0	5	B32686S7474+562	T2	12
470	30.0 × 45.0 × 42.0	12.0	5	B32686S7474+563	T3	18		

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5%


Electrical specifications, ordering codes and packing units

V_R	V_{rms} $f \leq 1\text{kHz}$	C_R	Max. dimensions $w \times h \times l$ mm	I_{rms} 100 kHz A	ESR 100 kHz $m\Omega$	Ordering code (composition see below)	Ter- minal	pcs./ unit
VDC	VAC	nF						
1600	450	47	12.0 × 22.5 × 42.0	5.0	30	B32686S1473+563	T3	56
		47	12.0 × 22.5 × 42.0	5.0	30	B32686S1473+564	T4	96
		68	14.0 × 25.0 × 42.0	6.0	20	B32686S1683+563	T3	48
		68	14.0 × 25.0 × 42.0	6.0	20	B32686S1683+564	T4	72
		68	14.0 × 25.0 × 42.0	6.0	20	B32686S1683+565	T5	72
		100	18.0 × 32.5 × 42.0	7.0	15	B32686S1104+563	T3	36
		100	18.0 × 32.5 × 42.0	7.0	15	B32686S1104+564	T4	32
		100	18.0 × 32.5 × 42.0	7.0	15	B32686S1104+565	T5	32
		120	18.0 × 32.5 × 42.0	7.5	13	B32686S1124+563	T3	36
		120	18.0 × 32.5 × 42.0	7.5	13	B32686S1124+564	T4	32
		120	18.0 × 32.5 × 42.0	7.5	13	B32686S1124+565	T5	32
		150	20.0 × 39.5 × 42.0	8.5	10	B32686S1154+561	T1	24
		150	20.0 × 39.5 × 42.0	8.5	10	B32686S1154+562	T2	24
		150	20.0 × 39.5 × 42.0	8.5	10	B32686S1154+563	T3	26
		150	20.0 × 39.5 × 42.0	8.5	10	B32686S1154+564	T4	24
		150	20.0 × 39.5 × 42.0	8.5	10	B32686S1154+565	T5	24
		220	28.0 × 37.0 × 42.0	10.5	7	B32686S1224+561	T1	27
		220	28.0 × 37.0 × 42.0	10.5	7	B32686S1224+562	T2	27
		220	28.0 × 37.0 × 42.0	10.5	7	B32686S1224+563	T3	18
		270	30.0 × 45.0 × 42.0	11.5	7	B32686S1274+561	T1	12
		270	30.0 × 45.0 × 42.0	11.5	7	B32686S1274+562	T2	12
		270	30.0 × 45.0 × 42.0	11.5	7	B32686S1274+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5%


B32686S
Snubbing (wound)
Electrical specifications, ordering codes and packing units

V_R	V_{rms} $f \leq 1\text{kHz}$	C_R	Max. dimensions $w \times h \times l$ mm	I_{rms} 100 kHz A	ESR 100 kHz $m\Omega$	Ordering code (composition see below)	Ter- minal	pcs./ unit
VDC	VAC	nF						
2000	500	22	12.0 × 22.5 × 42.0	4.0	70	B32686S2223+563	T3	56
		22	12.0 × 22.5 × 42.0	4.0	70	B32686S2223+564	T4	96
		33	14.0 × 25.0 × 42.0	5.0	50	B32686S2333+563	T3	48
		33	14.0 × 25.0 × 42.0	5.0	50	B32686S2333+564	T4	72
		33	14.0 × 25.0 × 42.0	5.0	50	B32686S2333+565	T5	72
		47	16.0 × 28.5 × 42.0	6.0	30	B32686S2473+563	T3	40
		47	16.0 × 28.5 × 42.0	6.0	30	B32686S2473+564	T4	48
		47	16.0 × 28.5 × 42.0	6.0	30	B32686S2473+565	T5	48
		68	18.0 × 32.5 × 42.0	7.5	20	B32686S2683+563	T3	36
		68	18.0 × 32.5 × 42.0	7.5	20	B32686S2683+564	T4	32
		68	18.0 × 32.5 × 42.0	7.5	20	B32686S2683+565	T5	32
		100	20.0 × 39.5 × 42.0	8.5	15	B32686S2104+561	T1	24
		100	20.0 × 39.5 × 42.0	8.5	15	B32686S2104+562	T2	24
		100	20.0 × 39.5 × 42.0	8.5	15	B32686S2104+563	T3	26
		100	20.0 × 39.5 × 42.0	8.5	15	B32686S2104+564	T4	24
		100	20.0 × 39.5 × 42.0	8.5	15	B32686S2104+565	T5	24
		120	28.0 × 37.0 × 42.0	9.0	13	B32686S2124+561	T1	24
		120	28.0 × 37.0 × 42.0	9.0	13	B32686S2124+562	T2	24
		120	28.0 × 37.0 × 42.0	9.0	13	B32686S2124+563	T3	26
		150	28.0 × 37.0 × 42.0	10.0	10	B32686S2154+561	T1	27
		150	28.0 × 37.0 × 42.0	10.0	10	B32686S2154+562	T2	27
		150	28.0 × 37.0 × 42.0	10.0	10	B32686S2154+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5%

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}	-55 °C	
	Rated temperature T_R	+85 °C	
Dissipation factor $\tan \delta$ at 20 °C (upper limit values)	1.0 · 10 ⁻³ (at 10 kHz)		
	3.0 · 10 ⁻³ (at 10 kHz)		
Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity ≤ 65% (minimum as-delivered values)	$C_R \leq 0.33 \mu F$	$C_R > 0.33 \mu F$	
	100 GΩ	30000 s	
DC test voltage	2.0 · V_R , 2 s		
Category voltage V_C (continuous operation with V_{DC} or V_{AC} at $f \leq 1$ kHz)	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 $f \leq 1$ kHz)	T_A (°C)	DC voltage (max. hours)	AC voltage (max. hours)
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (2000 h) $V_{op} = 1.25 \cdot V_C$ (1000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h) $V_{op} = 1.0 \cdot V_{C,rms}$ (1000 h)
Damp heat test Limit values after damp heat test	56 days/40 °C/93% relative humidity		
	Capacitance change $ \Delta C/C $	≤ 2%	
	Dissipation factor change $\Delta \tan \delta$	≤ 1.0 · 10 ⁻³ (at 10 kHz)	
	Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$	≥ 50% of minimum as-delivered values	
Reliability: Failure rate λ Service life t_{SL}	1 fit (≤ 1 · 10 ⁻⁹ /h) at 0.5 · V_R , 40 °C 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 Failure due to variation of parameters	Short circuit or open circuit Capacitance change $ \Delta C/C $ > 10% Dissipation factor $\tan \delta$ 4 · upper limit value Insulation resistance R_{ins} < 1500 MΩ ($C_R \leq 0.33 \mu F$) or time constant $\tau = C_R \cdot R_{ins}$ < 500 s ($C_R > 0.33 \mu F$)		



B32686S

Snubbing (wound)

Pulse handling capability

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

"k₀" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V²/μs.

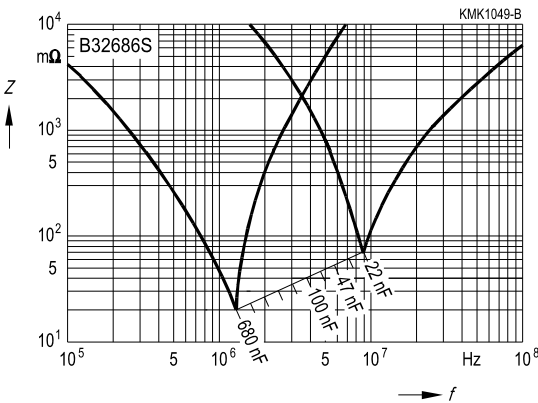
Note:

The values of dV/dt and k₀ provided below must not be exceeded in order to avoid damaging the capacitor.

dV/dt and k₀ values

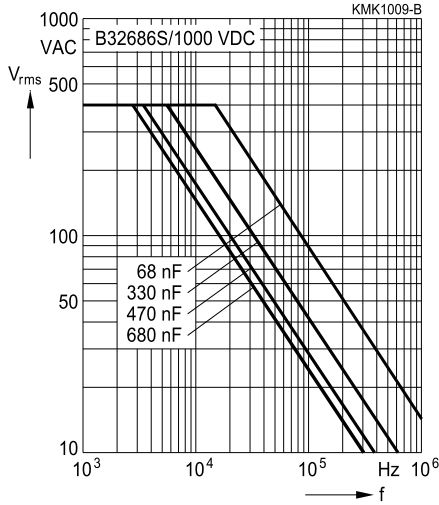
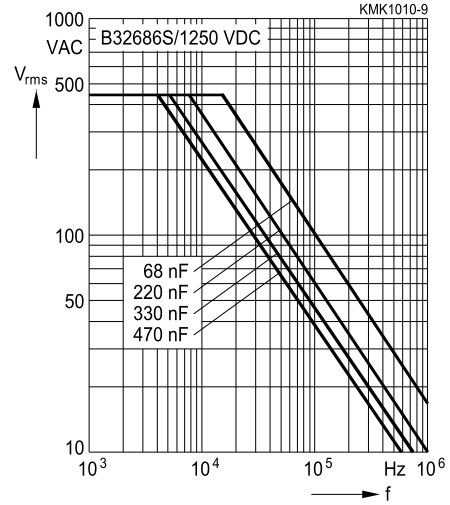
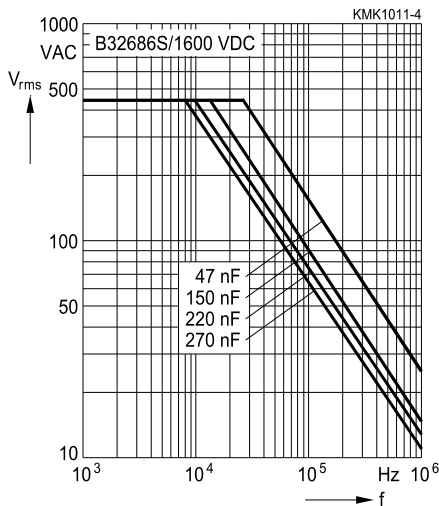
V _R (VDC)	V _{rms} (VAC)	dV/dt in V/μs	k ₀ in V ² /μs
1000	400	2 000	4 000 000
1250	450	2 800	7 000 000
1600	450	3 500	11 000 000
2000	500	4 500	18 000 000

Impedance Z versus frequency f
(typical values)



Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90^\circ\text{C}$)

 For $T_A > 90^\circ\text{C}$, please refer to "General technical information", section 3.2.3.

1000 VDC/400 VAC

1250 VDC/450 VAC

1600 VDC/450 VAC

2000 VDC/500 VAC
