



Film Capacitors

Metallized Polypropylene Film Capacitors (MFP)

Series/Type: B32686S
Date: August 2004

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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

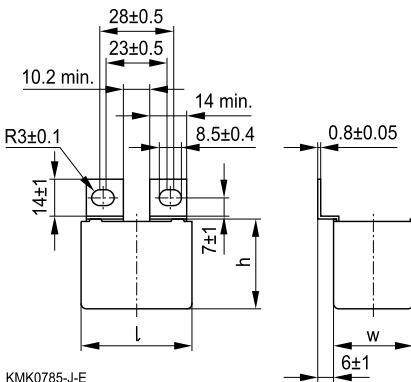
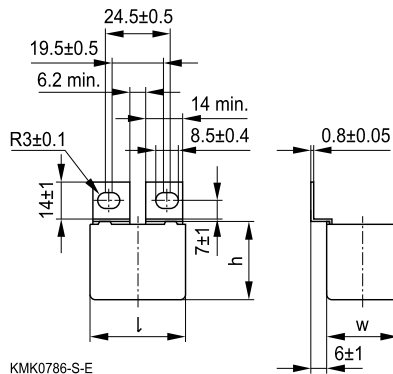
Terminals

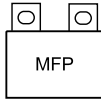
- Strap terminals, tinned copper (max. torque 10 Nm)

Marking

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

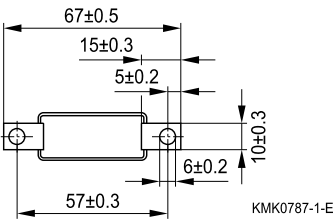
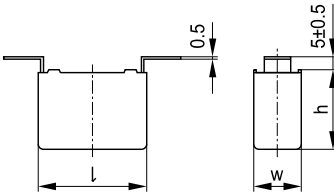
Delivery mode: Bulk

Dimensional drawings
T1 (code no. 561)

T2 (code no. 562)


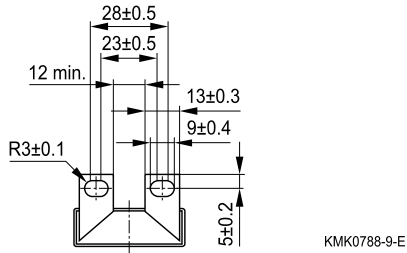
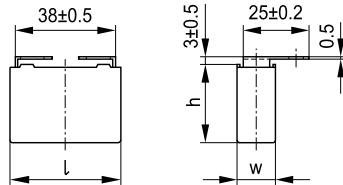


Dimensional drawings (continued)

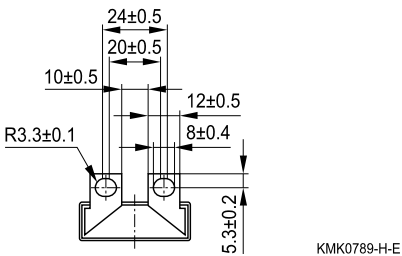
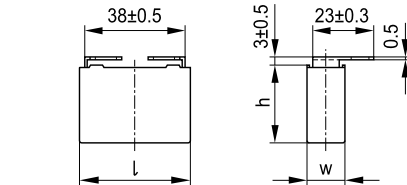
T3 (code no. 563)

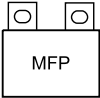


T4 (code no. 564)



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

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

K = $\pm 10\%$

J = $\pm 5\%$


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

V_R	V_{rms} $f \leq 1 \text{ kHz}$ VDC	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	$30.0 \times 45.0 \times 42.0$	12.0	3	B32686S0684+561	T1	12
		680	$30.0 \times 45.0 \times 42.0$	12.0	3	B32686S0684+562	T2	12
		680	$30.0 \times 45.0 \times 42.0$	12.0	3	B32686S0684+563	T3	18
1250	450	68	$12.0 \times 22.5 \times 42.0$	4.5	20	B32686S7683+563	T3	56
		68	$12.0 \times 22.5 \times 42.0$	4.5	20	B32686S7683+564	T4	96
		100	$14.0 \times 25.0 \times 42.0$	5.0	15	B32686S7104+563	T3	48
		100	$14.0 \times 25.0 \times 42.0$	5.0	15	B32686S7104+564	T4	72
		100	$14.0 \times 25.0 \times 42.0$	5.0	15	B32686S7104+565	T5	72
		120	$14.0 \times 25.0 \times 42.0$	5.5	13	B32686S7124+563	T3	48
		120	$14.0 \times 25.0 \times 42.0$	5.5	13	B32686S7124+564	T4	72
		120	$14.0 \times 25.0 \times 42.0$	5.5	13	B32686S7124+565	T5	72
		150	$16.0 \times 28.5 \times 42.0$	6.5	10	B32686S7154+563	T3	40
		150	$16.0 \times 28.5 \times 42.0$	6.5	10	B32686S7154+564	T4	48
		150	$16.0 \times 28.5 \times 42.0$	6.5	10	B32686S7154+565	T5	48
		220	$18.0 \times 32.5 \times 42.0$	8.5	7	B32686S7224+563	T3	36
		220	$18.0 \times 32.5 \times 42.0$	8.5	7	B32686S7224+564	T4	32
		220	$18.0 \times 32.5 \times 42.0$	8.5	7	B32686S7224+565	T5	32
		270	$20.0 \times 39.5 \times 42.0$	9.0	7	B32686S7274+561	T1	24
		270	$20.0 \times 39.5 \times 42.0$	9.0	7	B32686S7274+562	T2	24
		270	$20.0 \times 39.5 \times 42.0$	9.0	7	B32686S7274+563	T3	26
		270	$20.0 \times 39.5 \times 42.0$	9.0	7	B32686S7274+564	T4	24
		270	$20.0 \times 39.5 \times 42.0$	9.0	7	B32686S7274+565	T5	24
		330	$28.0 \times 37.0 \times 42.0$	10.0	5	B32686S7334+561	T1	27
		330	$28.0 \times 37.0 \times 42.0$	10.0	5	B32686S7334+562	T2	27
		330	$28.0 \times 37.0 \times 42.0$	10.0	5	B32686S7334+563	T3	18
		390	$28.0 \times 37.0 \times 42.0$	11.0	5	B32686S7394+561	T1	27
		390	$28.0 \times 37.0 \times 42.0$	11.0	5	B32686S7394+562	T2	27
		390	$28.0 \times 37.0 \times 42.0$	11.0	5	B32686S7394+563	T3	18
		470	$30.0 \times 45.0 \times 42.0$	12.0	5	B32686S7474+561	T1	12
		470	$30.0 \times 45.0 \times 42.0$	12.0	5	B32686S7474+562	T2	12
		470	$30.0 \times 45.0 \times 42.0$	12.0	5	B32686S7474+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

 M = $\pm 20\%$

 K = $\pm 10\%$

 J = $\pm 5\%$

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	$12.0 \times 22.5 \times 42.0$	5.0	30	B32686S1473+563	T3	56
		47	$12.0 \times 22.5 \times 42.0$	5.0	30	B32686S1473+564	T4	96
		68	$14.0 \times 25.0 \times 42.0$	6.0	20	B32686S1683+563	T3	48
		68	$14.0 \times 25.0 \times 42.0$	6.0	20	B32686S1683+564	T4	72
		68	$14.0 \times 25.0 \times 42.0$	6.0	20	B32686S1683+565	T5	72
		100	$18.0 \times 32.5 \times 42.0$	7.0	15	B32686S1104+563	T3	36
		100	$18.0 \times 32.5 \times 42.0$	7.0	15	B32686S1104+564	T4	32
		100	$18.0 \times 32.5 \times 42.0$	7.0	15	B32686S1104+565	T5	32
		120	$18.0 \times 32.5 \times 42.0$	7.5	13	B32686S1124+563	T3	36
		120	$18.0 \times 32.5 \times 42.0$	7.5	13	B32686S1124+564	T4	32
		120	$18.0 \times 32.5 \times 42.0$	7.5	13	B32686S1124+565	T5	32
		150	$20.0 \times 39.5 \times 42.0$	8.5	10	B32686S1154+561	T1	24
		150	$20.0 \times 39.5 \times 42.0$	8.5	10	B32686S1154+562	T2	24
		150	$20.0 \times 39.5 \times 42.0$	8.5	10	B32686S1154+563	T3	26
		150	$20.0 \times 39.5 \times 42.0$	8.5	10	B32686S1154+564	T4	24
		150	$20.0 \times 39.5 \times 42.0$	8.5	10	B32686S1154+565	T5	24
		220	$28.0 \times 37.0 \times 42.0$	10.5	7	B32686S1224+561	T1	27
		220	$28.0 \times 37.0 \times 42.0$	10.5	7	B32686S1224+562	T2	27
		220	$28.0 \times 37.0 \times 42.0$	10.5	7	B32686S1224+563	T3	18
		270	$30.0 \times 45.0 \times 42.0$	11.5	7	B32686S1274+561	T1	12
		270	$30.0 \times 45.0 \times 42.0$	11.5	7	B32686S1274+562	T2	12
		270	$30.0 \times 45.0 \times 42.0$	11.5	7	B32686S1274+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

K = $\pm 10\%$

J = $\pm 5\%$


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

V_R	V_{rms} $f \leq 1 \text{ kHz}$ VDC	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
2000	500	22	$12.0 \times 22.5 \times 42.0$	4.0	70	B32686S2223+563	T3	56
		22	$12.0 \times 22.5 \times 42.0$	4.0	70	B32686S2223+564	T4	96
		33	$14.0 \times 25.0 \times 42.0$	5.0	50	B32686S2333+563	T3	48
		33	$14.0 \times 25.0 \times 42.0$	5.0	50	B32686S2333+564	T4	72
		33	$14.0 \times 25.0 \times 42.0$	5.0	50	B32686S2333+565	T5	72
		47	$16.0 \times 28.5 \times 42.0$	6.0	30	B32686S2473+563	T3	40
		47	$16.0 \times 28.5 \times 42.0$	6.0	30	B32686S2473+564	T4	48
		47	$16.0 \times 28.5 \times 42.0$	6.0	30	B32686S2473+565	T5	48
		68	$18.0 \times 32.5 \times 42.0$	7.5	20	B32686S2683+563	T3	36
		68	$18.0 \times 32.5 \times 42.0$	7.5	20	B32686S2683+564	T4	32
		68	$18.0 \times 32.5 \times 42.0$	7.5	20	B32686S2683+565	T5	32
		100	$20.0 \times 39.5 \times 42.0$	8.5	15	B32686S2104+561	T1	24
		100	$20.0 \times 39.5 \times 42.0$	8.5	15	B32686S2104+562	T2	24
		100	$20.0 \times 39.5 \times 42.0$	8.5	15	B32686S2104+563	T3	26
		100	$20.0 \times 39.5 \times 42.0$	8.5	15	B32686S2104+564	T4	24
		100	$20.0 \times 39.5 \times 42.0$	8.5	15	B32686S2104+565	T5	24
		120	$28.0 \times 37.0 \times 42.0$	9.0	13	B32686S2124+561	T1	24
		120	$28.0 \times 37.0 \times 42.0$	9.0	13	B32686S2124+562	T2	24
		120	$28.0 \times 37.0 \times 42.0$	9.0	13	B32686S2124+563	T3	26
		150	$28.0 \times 37.0 \times 42.0$	10.0	10	B32686S2154+561	T1	27
		150	$28.0 \times 37.0 \times 42.0$	10.0	10	B32686S2154+562	T2	27
		150	$28.0 \times 37.0 \times 42.0$	10.0	10	B32686S2154+563	T3	18

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

K = $\pm 10\%$

J = $\pm 5\%$

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 ≤ 1 kHz)	T_A (°C)	DC voltage derating	AC voltage derating
	$T_A \leq 85$	$V_C = V_R$	$V_{C,rms} = V_{rms}$
	$85 < T_A \leq 100$	$V_C = V_R \cdot (165 - T_A)/80$	$V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage V_{op} for short operating periods (V_{DC} or V_{AC} at f ≤ 1 kHz)	T_A (°C)	DC voltage (max. hours)	AC voltage (max. hours)
	$T_A \leq 85$	$V_{op} = 1.25 \cdot V_C$ (2000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h)
	$85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (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 heat test	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	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 of parameters	Capacitance change $ \Delta C/C $		> 10%
	Dissipation factor $\tan \delta$		4 · upper limit value
	Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$		< 1500 MΩ ($C_R \leq 0.33 \mu F$) < 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.

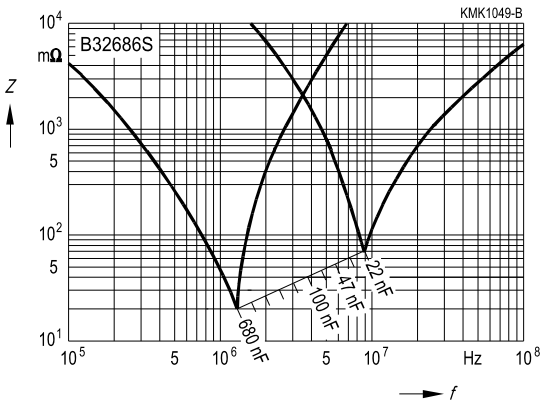
Note:

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

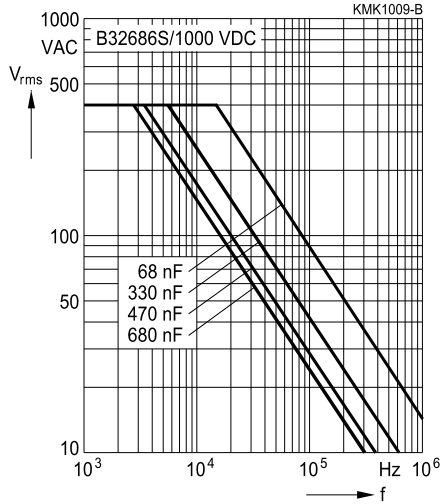
Impedance Z versus frequency f (typical values)



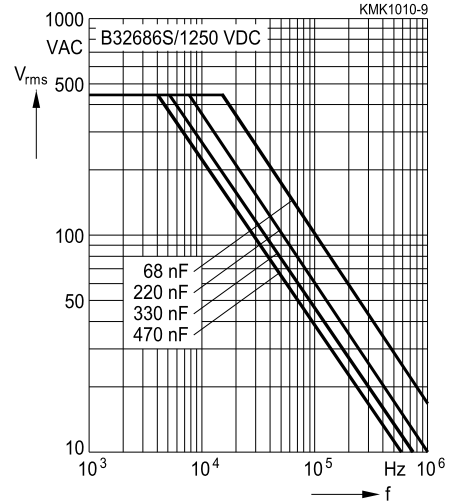
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90^\circ\text{C}$)

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

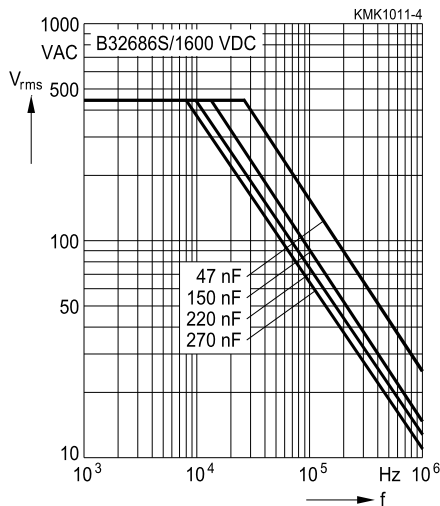
1000 VDC/400 VAC



1250 VDC/450 VAC



1600 VDC/450 VAC



2000 VDC/500 VAC

