



# Film capacitors - power electronic capacitors

## General purpose applications

### Series/Type: **B32360 ... B32364**

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B32360A2806J050		2013-03-15	2013-06-30	2013-12-31
B32360A2706J050		2013-03-15	2013-06-30	2013-12-31
B32360A2606J050		2013-03-15	2013-06-30	2013-12-31

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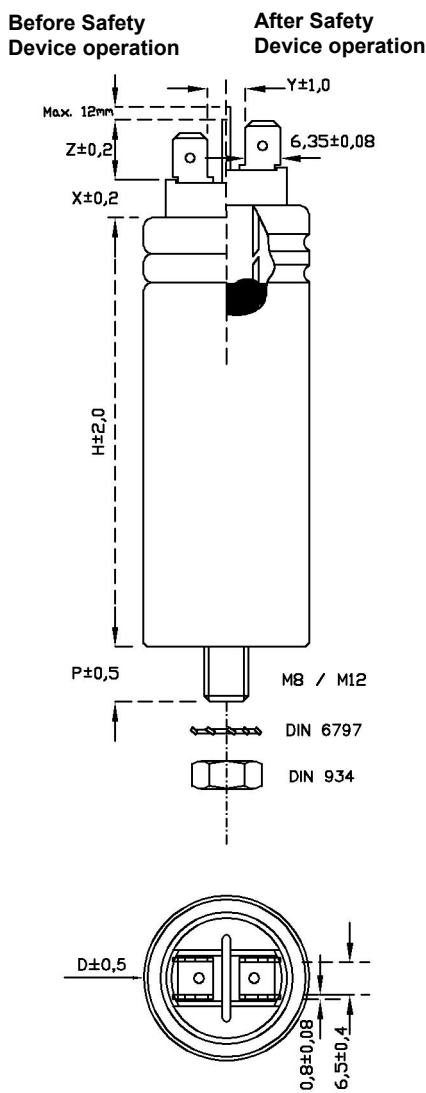
Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B32360A2506J050		2013-03-15	2013-06-30	2013-12-31
B32360A2406J050		2013-03-15	2013-06-30	2013-12-31
B32360A2306J050		2013-03-15	2013-06-30	2013-12-31
B32360A2206J050		2013-03-15	2013-06-30	2013-12-31
B32360A2156J050		2013-03-15	2013-06-30	2013-12-31
B32360A2107J050		2013-03-13	2013-06-30	2013-12-31
B32360A2106J050		2013-03-15	2013-06-30	2013-12-31
B32360B3606J030		2013-03-15	2013-06-30	2013-12-31
B32360B3406J030		2013-03-15	2013-06-30	2013-12-31
B32360B3107J030		2013-03-15	2013-06-30	2013-12-31
B32360B2256J050		2013-03-15	2013-06-30	2013-12-31
B32360B2157J050		2013-03-15	2013-06-30	2013-12-31
B32360A4706J080		2013-03-15	2013-06-30	2013-12-31
B32360A4606J080		2013-03-15	2013-06-30	2013-12-31
B32360A4506J080		2013-03-15	2013-06-30	2013-12-31
B32360A4505J080		2013-03-15	2013-06-30	2013-12-31
B32360A4406J080		2013-03-15	2013-06-30	2013-12-31
B32360A4306J080		2013-03-15	2013-06-30	2013-12-31
B32360A4305J080		2013-03-15	2013-06-30	2013-12-31
B32360A4256J080		2013-03-15	2013-06-30	2013-12-31
B32360A4206J080		2013-03-15	2013-06-30	2013-12-31
B32360A4156J080		2013-03-15	2013-06-30	2013-12-31
B32360A4106J080		2013-03-15	2013-06-30	2013-12-31
B32360A3806J030		2013-03-15	2013-06-30	2013-12-31
B32360A3706J030		2013-03-15	2013-06-30	2013-12-31
B32360A3506J030		2013-03-15	2013-06-30	2013-12-31
B32360A3306J030		2013-03-15	2013-06-30	2013-12-31
B32360A3256J030		2013-03-15	2013-06-30	2013-12-31
B32360A3206J030		2013-03-15	2013-06-30	2013-12-31
B32360A3156J030		2013-03-15	2013-06-30	2013-12-31
B32360A3106J030		2013-03-15	2013-06-30	2013-12-31

For further information please contact your nearest EPCOS sales office, which will also support you in selecting a suitable substitute. The addresses of our worldwide sales network are presented at [www.epcos.com/sales](http://www.epcos.com/sales).

Preliminary data

Metallized polypropylene film capacitors - aluminum case for general purpose applications

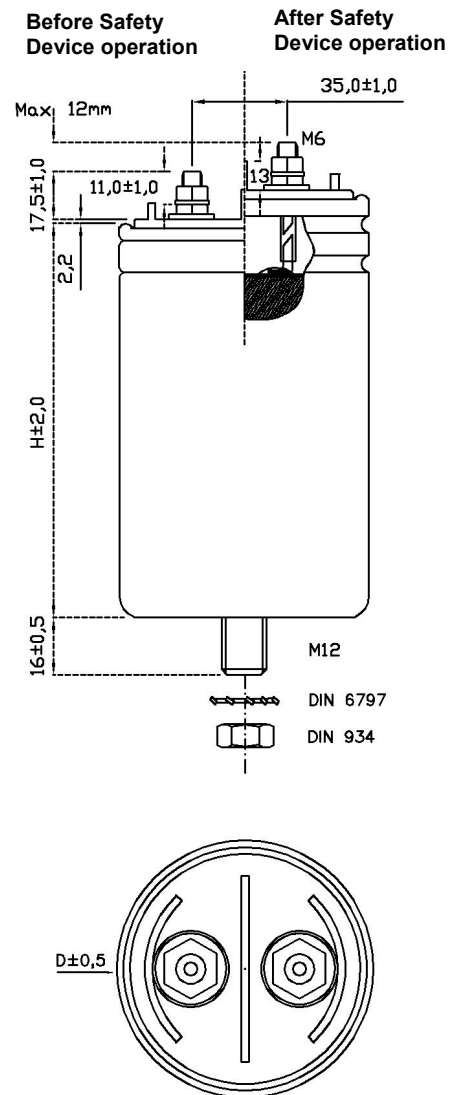
**B32360**  
Fast-on terminals



**Picture 1**

- X = 5 mm (D < 53 mm)  
0 mm (D ≥ 53 mm)
- Z = 13.5 mm (D < 53 mm)  
13 mm (D ≥ 53 mm)

**B32361**  
M6 screw terminals



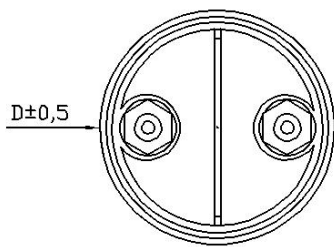
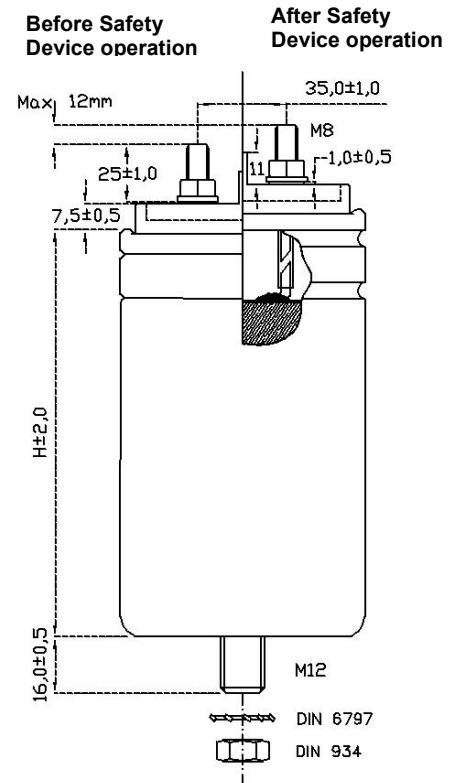
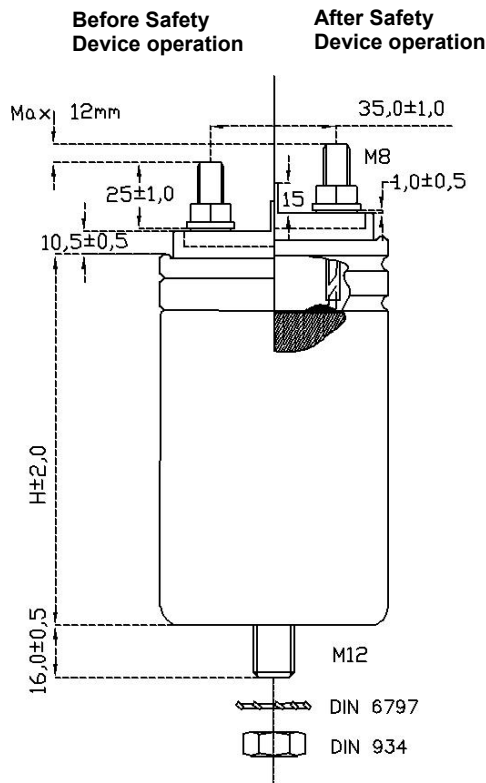
**Picture 2**

- Y = 8.30 mm (D ≥ 40 mm)  
6.30 mm (D < 40 mm)
- P = 10 mm (M8)  
16 mm (M12)

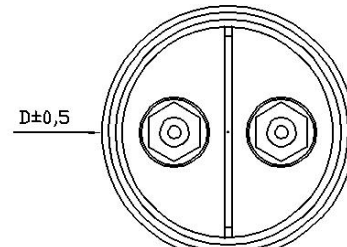
Preliminary data

**B32364**  
**M8 screw terminals**  
**D < 75mm**

**B32364**  
**M8 screw terminals**  
**D ≥ 75mm**

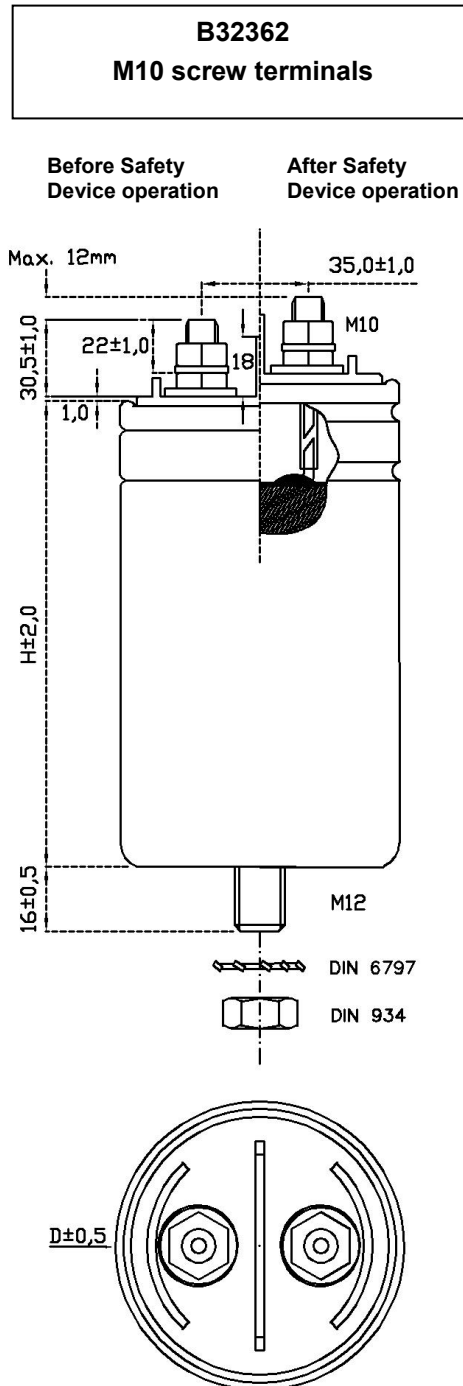


**Picture 3**



**Picture 4**

Preliminary data

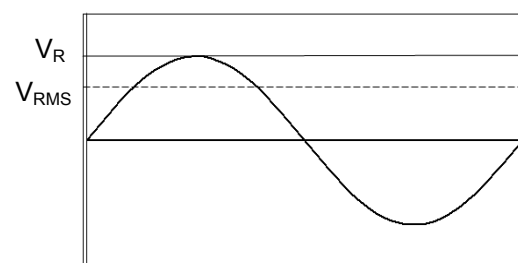


Picture 5

**Preliminary data**
**Specifications and characteristics**

Rated capacitance  $C_R$ : 3  $\mu$ F ... 600  $\mu$ F  
 Tolerance:  $\pm 5\%$

Rated AC voltage $V_{RMS}$	Rated AC voltage $V_R$	Repetitive peak voltage $V_N$	Non repetitive peak voltage $V_s$
250 V	350 V	750 V	1125 V
330 V	460 V	900 V	1350 V
480 V	680 V	1200 V	1800 V


**Test data**

Voltage between terminals  $V_{TT}$ :  $2.15 \cdot V_{RMS}, 2 \text{ s}$   
 Voltage between terminals and aluminum can  $V_{TC}$ :  $3000 \text{ V AC}_{RMS}, 2 \text{ s}$

Dissipation factor  $\tan \delta$  at 100 Hz:  $\leq 1.0 \cdot 10^{-3}$   
 Life test: IEC 61071  
 Life expectancy: 100000 hours for  $V_{RMS} |\Delta C/C| \leq 3\%$

**Climatic category:** **40/70/21**

$\theta_{stg}^*$ :  $-40 \text{ }^\circ\text{C} \dots +85 \text{ }^\circ\text{C}$   
 $\theta_{min}$ :  $-40 \text{ }^\circ\text{C}$   
 $\theta_{max}^{**}$ :  $+70 \text{ }^\circ\text{C}$   
 $\theta_{hs}^{***}$ :  $+85 \text{ }^\circ\text{C}$   
 Max. permissible humidity: 95% ( $t_{test} = 21 \text{ days}$ )  
 Max. permissible altitude: 2000 m above sea level

\*:  $\theta_{stg}$  – Storage temperature.  
 \*\*: Considering mounting position with terminals to the top. For other mounting position, please request evaluation.  
 \*\*\*:  $\theta_{hs}$  – maximum temperature allowed at the capacitors hot spot.

**Mechanical characteristics**

Max. torque (case): M8: 6 Nm  
 M12: 12 Nm

Max. torque (terminal): M6: 4 Nm  
 M8: 6 Nm  
 M10: 10 Nm

**Construction and general data**

Resin filling: Non PCB, soft polyurethane  
 Safety device: Overpressure disconnecter, self-healing technology  
 Mounting and grounding: Stud on bottom of aluminum can  
 Cooling: Naturally air-cooled (or forced air cooling)  
 Degree of protection: Indoor mounting  
 Pollution degree: PD4  
 Reference standards: IEC 1071  
 UL approval file: E106388 (Pending for B32364 series)

**Preliminary data**
**Electrical characteristics**

Clearance and creepage distances:

Series	Diameter (mm)	Terminal to terminal		Terminal to case	
		Clearance (mm)	Creepage (mm)	Clearance (mm)	Creepage (mm)
B32360	40	10	14	14	15
	53	10	13	12	12
	63	10	13	19	19
B32361	63	23	30	13	12
B32362	75	25	55	14	16
	85	25	63	17	19
B32364	63	27	52	14	14
	75	27	60	16	24

**Maximum current  $I_{max}$** 

The maximum RMS current for continuous operation

**Maximum peak current  $\hat{i}$** 

The maximum current amplitude which occurs instantaneously during continuous operation. The maximum peak current ( $\hat{i}$ ) and the maximum rate of voltage rise  $(dV/dt)_{max}$  on a capacitor are related as follows:

$$\hat{i} = C \cdot (dV/dt)_{max}$$

**Maximum surge current  $I_s$** 

The admissible peak current induced by a switching or any other disturbance of the system which is allowed for a limited number of times.

$$I_s = C \cdot (dV/dt)_s$$

Maximum duration: 50 ms/pulse  
 Maximum number of occurrences: 1000 (during load)

**Series Resistance  $R_s$** 

The series resistance of a capacitor is the result of the resistive losses that occur in the electrodes, in the contacting and in the inner wiring.

The series resistance  $R_s$  generates the ohmic losses ( $I^2 \cdot R_s$ ) in a capacitor, and it is largely independent of frequency.

**Self-Inductance  $L_{self}$** 

The self-inductance is produced by the inductance of the terminals and the windings. With Self-Inductance, it is possible to determine the Resonance Frequency.

$$F = \frac{1}{2\pi \sqrt{L_{self} C}}$$

**Film capacitors – Power Electronic Capacitors**
**General purpose applications**
**B32360 ... B32364**
**Preliminary data**
**B32360**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
350 V AC	10	B32360A2106J050	10	300	0.9	6.9	170	40.0	68	M8	0.1	45
250 V AC	15	B32360A2156J050	12	450	1.3	5.6	170	40.0	68	M8	0.1	45
	20	B32360A2206J050	10	500	1.5	5.4	170	40.0	68	M8	0.1	45
	25	B32360B2256J050	12	600	1.9	6.8	170	40.0	80	M8	0.2	45
	30	B32360A2306J050	15	750	2.2	4.6	170	53.0	70	M8	0.2	12
	40	B32360A2406J050	16	1000	3.0	4.2	170	53.0	70	M8	0.2	12
	50	B32360A2506J050	16	900	2.8	5.1	190	53.0	82	M8	0.2	12
	60	B32360A2606J050	16	1100	3.3	4.8	190	53.0	82	M8	0.2	12
	70	B32360A2706J050	16	1300	3.8	4.6	190	63.5	82	M12	0.3	12
	80	B32360A2806J050	16	1500	4.4	4.4	190	63.5	82	M12	0.3	12
	100	B32360A2107J050	16	1200	3.6	6.0	210	63.5	107	M12	0.4	12
	150	B32360B2157J050	16	1300	4.0	7.0	250	63.5	132	M12	0.5	12

**B32361**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
350 V AC	50	B32361A2506J050	25	1250	3.8	3.7	195	63.5	70	M12	0.3	12
250 V AC	60	B32361A2606J050	25	1500	4.5	3.6	195	63.5	70	M12	0.3	12
	70	B32361A2706J050	25	1300	3.8	4.2	220	63.5	82	M12	0.3	12
	80	B32361A2806J050	25	1500	4.4	4.1	220	63.5	82	M12	0.3	12
	100	B32361A2107J050	25	1200	3.6	5.5	225	63.5	107	M12	0.4	12
	150	B32361A2157J050	25	1300	4.0	6.3	265	63.5	132	M12	0.5	12
	200	B32361B2207J050	25	1600	4.8	6.3	275	63.5	142	M12	0.6	12

**B32362**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
350 V AC	150	B32362A2157J050	35	1800	5.4	2.5	185	75.0	117	M12	0.7	6
250 V AC	200	B32362B2207J050	50	2400	7.2	2.1	185	85.0	117	M12	0.8	4
	250	B32362A2257J050	40	2000	6.0	3.0	210	75.0	152	M12	0.9	6
	300	B32362A2307J050	50	3600	10.8	1.7	200	75.0	197	M12	1.1	6
	400	B32362A2407J050	50	4800	14.4	1.5	200	85.0	197	M12	1.3	4
	500	B32362B2507J050	50	4400	13.3	1.9	230	85.0	247	M12	1.7	4
	600	B32362B2607J050	50	5300	16.0	1.8	230	85.0	247	M12	1.7	4

**B32364**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
350 V AC	60	B32364A2606J050	25	1520	4.6	2.3	170	63.5	70	M12	0.3	12
250 V AC	80	B32364A2806J050	25	1480	4.4	2.7	180	63.5	82	M12	0.3	12
	100	B32364A2107J050	25	1200	3.6	3.8	200	63.5	107	M12	0.4	12
	150	B32364A2157J050	35	1800	5.4	3.1	210	75.0	117	M12	0.7	6
	200	B32364B2207J050	35	1777	5.3	3.7	230	75.0	142	M12	0.8	6
	250	B32364A2257J050	35	2000	6.0	3.8	240	75.0	152	M12	0.9	6
	300	B32364A2307J050	35	3600	10.8	2.5	240	75.0	197	M12	1.1	6



**Film capacitors – Power Electronic Capacitors**
**General purpose applications**
**B32360 ... B32364**
**Preliminary data**
**B32360**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
460 V AC	10	B32360A3106J030	12	300	0.9	6.9	170	53.0	70	M8	0.2	12
330 V AC	15	B32360A3156J030	12	450	1.3	5.6	170	53.0	70	M8	0.2	12
	20	B32360A3206J030	13	600	1.8	5.0	170	53.0	70	M8	0.2	12
	25	B32360A3256J030	15	750	2.3	4.6	170	53.0	70	M8	0.2	12
	30	B32360A3306J030	15	650	2.0	5.7	190	53.0	82	M8	0.2	12
	40	B32360B3406J030	15	850	2.7	5.1	190	53.0	82	M8	0.2	12
	50	B32360A3506J030	15	700	2.2	7.3	210	53.0	107	M8	0.3	12
	60	B32360B3606J030	16	850	2.6	6.8	210	53.0	107	M8	0.3	12
	70	B32360A3706J030	16	1000	3.0	6.4	210	63.5	107	M12	0.4	12
	80	B32360A3806J030	16	1150	3.5	6.1	210	63.5	107	M12	0.4	12
	100	B32360B3107J030	16	1050	3.2	7.6	250	63.5	132	M12	0.5	12

**B32361**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
460 V AC	50	B32361B3506J030	18	920	2.7	4.4	220	63.5	82	M12	0.3	12
330 V AC	60	B32361A3606J030	18	720	2.1	6.2	225	63.5	107	M12	0.4	12
	70	B32361A3706J030	20	840	2.5	5.8	225	63.5	107	M12	0.4	12
	80	B32361A3806J030	25	960	2.8	5.5	225	63.5	107	M12	0.4	12
	100	B32361B3107J030	25	880	2.6	6.9	265	63.5	132	M12	0.5	12

**B32362**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
460 V AC	100	B32362A3107J030	30	1450	4.3	2.8	185	75.0	117	M12	0.7	6
330 V AC	150	B32362A3157J030	30	1450	4.3	3.7	210	75.0	152	M12	0.9	6
	200	B32362B3207J030	40	1900	5.8	3.1	210	85.0	152	M12	1.0	4
	250	B32362A3257J030	50	3600	10.8	1.7	200	85.0	197	M12	1.3	4
	300	B32362A3307J030	50	4300	12.9	1.6	200	85.0	197	M12	1.3	4
	400	B32362A3407J030	50	3850	11.6	2.1	240	85.0	267	M12	1.8	4

**B32364**

$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
460 V AC	50	B32364A3506J030	25	1110	3.3	3.0	180	63.5	82	M12	0.7	12
330 V AC	80	B32364A3806J030	25	1150	3.5	3.9	200	63.5	107	M12	0.9	12
	100	B32364B3107J030	30	1440	4.3	3.4	210	75.0	117	M12	1.0	6
	150	B32364A3157J030	30	1450	4.3	4.5	240	75.0	152	M12	1.3	6
	200	B32364A3207J030	35	2880	8.6	2.6	240	75.0	197	M12	1.3	6

**Film capacitors – Power Electronic Capacitors**
**General purpose applications**
**B32360 ... B32364**
**Preliminary data**

<b>B32360</b>												
$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
680 V AC	3	B32360A4305J080	6	120	0.4	12.9	170	40.0	68	M8	0.1	45
480 V AC	5	B32360A4505J080	8	200	0.6	8.9	170	40.0	68	M8	0.1	45
	10	B32360A4106J080	10	400	1.2	6.0	170	53.0	70	M8	0.2	12
	15	B32360A4156J080	15	600	1.8	5.0	170	53.0	70	M8	0.2	12
	20	B32360A4206J080	15	600	1.7	6.0	190	53.0	82	M8	0.2	12
	25	B32360A4256J080	15	500	1.4	9.0	210	53.0	107	M8	0.3	12
	30	B32360A4306J080	15	600	1.7	8.2	210	53.0	107	M8	0.3	12
	40	B32360A4406J080	16	750	2.3	7.1	210	63.5	107	M12	0.4	12
	50	B32360A4506J080	16	950	2.9	6.5	210	63.5	107	M12	0.4	12
	60	B32360A4606J080	16	850	2.6	8.4	250	63.5	132	M12	0.5	12
	70	B32360A4706J080	16	900	2.7	8.8	265	63.5	142	M12	0.6	12

<b>B32361</b>												
$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
680 V AC	20	B32361A4206J080	20	800	2.4	4.3	195	63.5	70	M12	0.3	12
480 V AC	25	B32361A4256J080	25	750	2.2	5.2	220	63.5	82	M12	0.3	12
	30	B32361A4306J080	25	800	2.6	4.8	220	63.5	82	M12	0.3	12
	40	B32361A4406J080	20	750	2.3	6.6	225	63.5	107	M12	0.4	12
	50	B32361A4506J080	25	950	2.9	6.0	225	63.5	107	M12	0.4	12
	60	B32361A4606J080	25	850	2.6	7.7	265	63.5	132	M12	0.5	12
	70	B32361A4706J080	25	900	2.7	8.0	275	63.5	142	M12	0.6	12

<b>B32362</b>												
$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight kg	Packing units pcs.
680 V AC	60	B32362A4606J080	30	1150	3.4	3.2	185	75.0	117	M12	0.7	6
480 V AC	70	B32362A4706J080	50	2050	6.2	1.7	180	75.0	147	M12	0.9	6
	80	B32362A4806J080	50	1350	7.1	1.6	180	75.0	147	M12	0.9	6
	100	B32362A4107J080	50	1900	5.7	2.3	200	75.0	197	M12	1.1	6
	150	B32362A4157J080	50	2850	8.6	1.9	200	85.0	197	M12	1.3	4
	200	B32362A4207J080	50	2850	8.5	2.3	230	85.0	247	M12	1.7	4
	250	B32362A4257J080	50	3200	9.6	2.3	240	85.0	267	M12	1.8	4

<b>B32364</b>												
$V_R$ $V_{RMS}$	$C_R$ $\mu F$	Ordering code	$I_{max}$ A	$\hat{i}$ A	$I_s$ kA	$R_s$ m $\Omega$	$L_{self}$ nH	D mm	H mm	Stud	Weight Kg	Packing units pcs.
680 V AC	30	B32364A4306J080	20	890	2.7	3.4	180	63.5	82	M12	0.3	12
480 V AC	50	B32364A4506J080	20	960	2.9	4.3	200	63.5	107	M12	0.4	12
	60	B32364A4606J080	25	1150	3.5	3.9	210	75.0	117	M12	0.7	6
	80	B32364A4806J080	35	2368	7.1	2.2	210	75.0	147	M12	0.9	6
	100	B32364B4107J080	35	1921	5.8	3.1	240	75.0	197	M12	1.1	6

**Preliminary data****Cautions and warnings**

- In case of dents of more than 1 mm depth or any other mechanical damage, capacitors must not be used at all. This applies also in cases of leakage.
- To ensure the full functionality of the overpressure disconnecter, elastic elements must not be hindered and a minimum space of 12 mm has to be kept above each capacitor.
- Check tightness of the connections/terminals periodically.
- The energy stored in capacitors may be lethal. To prevent any chance of shock, discharge and short-circuit the capacitor before handling.
- Failure to follow cautions may result, worst case, in premature failures, bursting and fire.
- EPCOS AG is not responsible for any kind of possible damages to persons or things due to improper installation and application of capacitors for power electronics.

**Safety**

- Electrical or mechanical misapplication of capacitors may be hazardous. Personal injury or property damage may result from bursting of the capacitor or from expulsion of oil or melted material due to mechanical disruption of the capacitor.
- Ensure good, effective grounding for capacitor enclosures.
- Observe appropriate safety precautions during operation (self-recharging phenomena and the high energy contained in capacitors).
- Handle capacitors carefully, because they may still be charged even after disconnection.
- The terminals of capacitors, connected bus bars and cables as well as other devices may also be energized.
- Follow good engineering practice.

**Thermal load**

After installation of the capacitor it is necessary to verify that maximum hot-spot temperature is not exceeded at extreme service conditions.

**Mechanical protection**

The capacitor has to be installed in a way that mechanical damages and dents in the aluminum can are avoided.

**Storage and operating conditions**

Do not use or store capacitors in corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. In dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between phases and/or phases and ground.

The maximum storage temperature is 85 °C.

**Preliminary data****Overpressure disconnecter**

To ensure full functionality of an overpressure disconnecter, the following must be observed:

1. The elastic elements must not be hindered, i.e.
  - connecting lines must be flexible leads (cables).
  - there must be sufficient space for expansion above the connections.
  - folding crimps must not be retained by clamps.
2. Stress parameters of the capacitor must be within the IEC61071 specification.

**Service life expectancy**

Electrical components do not have an unlimited service life expectancy; this applies to self-healing capacitors, too. The maximum service life expectancy may vary depending on the application the capacitor is used in.

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
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