



## Film capacitors – Power Electronic Capacitors

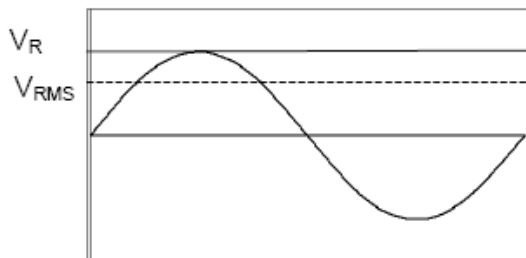
General purpose applications

**Series/Type:** MKP AC HP  
**Ordering code:** B2536\*  
Date: May 2012  
Version: 2

**Construction and general data**

- Metallized polypropylene film capacitors
- Aluminum case for general purpose applications
- Oil filling: Castor oil
- 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

<b>Characteristics</b>			
Rated capacitance $C_N$	10 ... 150 $\mu\text{F}$		
Tolerance	$\pm 5\%$		
Connection	M10 terminals		
Rated AC voltage $V_{\text{RMS}}$	Rated DC voltage $V_R$	Repetitive peak voltage $V_i$	Non repetitive peak voltage $V_s$
550 V	780 V	910 V	1800 V
640 V	900 V	1060 V	2100 V
780 V	1100 V	1290 V	2600 V
1000 V	1400 V	1650 V	3300 V


**Test data**

Voltage between terminals $V_{\text{TT}}$	$1.5 \cdot V_{\text{RMS}}$ , 60 s
Voltage between terminals and aluminium can $V_{\text{TC}}$	3000 V $\text{AC}_{\text{RMS}}$ , 10 s
Dissipation factor $\tan \delta$ (100 Hz)	$\leq 1.0 \cdot 10^{-3}$
Life test	IEC 61071
Life expectancy	Up to 100 000 hours for $V_{\text{RMS}}  \Delta C/C  \leq 3\%$

**Climatic category 40/70/21**

Minimum temperature $\Theta_{\min.}$	-40 °C
Maximum temperature $\Theta_{\max.}$ *	+60 °C
Storage temperature $\Theta_{\text{stg}}$	-40 °C ... +85 °C
Maximum hotspot temperature $\Theta_{\text{hs}}$ **	+70 °C
Humidity	95% ( $t_{\text{test}} = 21$ days)
Maximum altitude	2000 m above sea level

\*Considering mounting position with terminals to the top. For other mounting position, please request evaluation.

\*\*Maximum temperature allowed at the capacitors hot spot

**Design data**

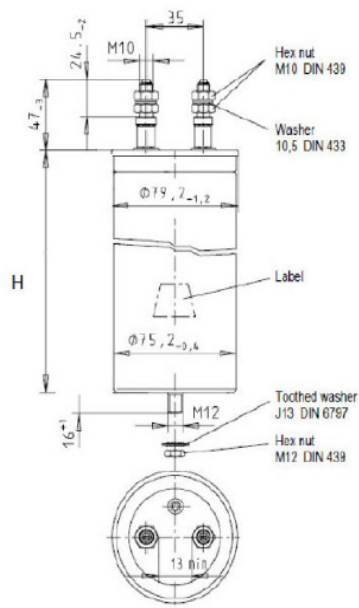
Dimensions (d x h)	According to specification table
Weight approx.	According to specification table
Impregnation	Castor oil, non PCB
Fixing	Threaded bolt M12
Max. torque	M12: 12 Nm
Max. torque	M10: 10 Nm
Mounting position	Upright

**Reference standards**

IEC 61071

Certification: UL 810-5th edition

**Dimensional drawing M10 screw terminal**



## Terms and formulas

### 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 $L_{\text{self}}$

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.

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

**Specifications and ordering codes**

$V_{RMS}$	C $\mu F$	$I_{MAX}$ A	$\hat{I}$ kA	$I_s$ kA	D mm	H mm	Weight kg	Ordering code
550	33	45	1.9	5.6	75	115	0.6	B25360A5336J050
	47	50	1.9	5.7	75	140	0.8	B25360A5476J050
	68	50	3.8	11.6	75	195	1.1	B25360A5686J050
	95	60	3.8	11.5	75	245	1.5	B25360A5956J050
	130	60	5.2	15.7	85	245	1.6	B25360A5137J050
	150	60	5.2	15.8	85	270	1.7	B25360A5157J050
640	22	40	1.5	4.5	75	115	0.7	B25360A6226J040
	33	45	1.6	4.8	75	140	0.8	B25360A6336J040
	50	50	3.2	9.6	75	195	1.1	B25360A6506J040
	68	60	3.3	9.8	75	245	1.4	B25360A6686J040
	90	60	4.3	13.1	85	245	1.6	B25360A6906J040
	100	60	4.2	12.6	85	270	1.8	B25360A6107J040
780	15	35	1.2	3.6	75	115	0.7	B25360A7156J080
	22	40	1.2	3.7	75	140	0.8	B25360A7226J080
	33	50	2.6	7.9	75	195	1.1	B25360A7336J080
	47	55	2.6	7.9	75	245	1.4	B25360A7476J080
	75	60	3.7	11.1	85	270	1.7	B25360A7756J080
1000	10	30	1.2	3.6	75	115	0.7	B25360A1106J100
	20	40	1.5	5.0	75	140	0.8	B25360A1206J100
	33	50	2.9	8.7	75	245	1.4	B25360A1336J100
	47	60	4.1	12.4	85	245	1.6	B25360A1476J100
	55	60	4.3	12.8	85	270	1.7	B25360A1556J100

### 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.

### 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

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