MKV AC, MKV DC capacitors

LSI Snubbering and Clamping

Ordering code: **B25855**
Date: September 2005

Features

- High rate of voltage rise
- High peak-current capability
- Extremely low inductance

Construction

- Self-healing
- Plastic dielectric
- Oil-impregnated tubular windings (no PCB)
- Metal-sprayed end faces ensure reliable contacting
- Cylindrical aluminum case
- Also available in high-grade, freon-resistant steel case upon request
- Coaxial winding design with internal low-inductance circuitry
- Mounting bolt M12

Terminals

- Screw terminals M6 … M12

Mounting

- If the vibration stress is ≤ 5 *g* and the capacitors are ≤ 60 mm in diameter and ≤ 160 mm in height, the bolt is used for mounting.

Grounding

- Mounting bolt for grounding in accordance with VDE 0100
- Grounding identification in accordance with DIN 40 011

Individual data sheets

Individual data sheets contain detailed specification incl. thermal data. Upon request, these data sheets are available for each capacitor type.

Technical data

Standards		IEC 1071-1/2 EN 61071-1/2 VDE 0560 part 120 and 121
Dielectric dissipation factor	$\tan \delta_0$	$2 \cdot 10^{-4}$
Capacitance tolerance		$\pm$ 10%
Max. repetitive rate of voltage rise	$(dv/dt)_{max}$	$\frac{\hat{i}}{C}$
Max. non-repetitive rate of voltage rise	$(du/dt)_s$	$\frac{I_S}{C}$
Climatic data:		
Min. operating temperature	T_{min}	– 25 °C (– 40 °C upon request)
Max. operating temperature	T_{max}	+ 85 °C
Average relative humidity		≤ 95%
Failure quota	$\alpha_{FQ(co)}$	300 failures per 10^9 component hours
Load duration	$t_{LD(co)}$	100 000 h
Storage temperature limit	T_{stg}	– 55/+ 85 °C
IEC climatic category (IEC 68-1 and 2)		25/085/56 (40/085/56 upon request)
Test data:		
Voltage test between terminals		
DC test voltage	V_{TT}	1,5 x V_R, 10 s (V_R = DC) 1,75 x V_R, 10 s (V_R = AC)
AC test voltage (rms value)	V_{TT}	1,25 x V_R, 50 Hz, 10 s (V_R = AC)
Voltage test between terminals and case		
AC test voltage (rms value)	V_{TC}	($2 \cdot V_i$ + 1000 V), 50 Hz, 10 s Insulating voltage V_i = max. recurrent peak voltage $\hat{v} / \sqrt{2}$
Insulation resistance	R_{ins}	$C_R \leq 1$ µF: ≥ 10000 MΩ
Self-discharge time constant	$\tau = R_{ins} \cdot C$	$C_R > 1$ µF: ≥ 10000 s
Dissipation factor (50 Hz)	$\tan \delta$	$\leq 3 \cdot 10^{-4}$

Characteristics and ordering codes

C_R[1)]	I_{max}	$\hat{i}$	I_s	R_S 20 °C	L_{self}	Dimensions d × l	Fig.	Appr. weight	Ordering code
µF	A	A	A	mΩ	nH	mm		g	
V_{RDC} = AC 1300 V				$\hat{v}$ = 1600 V				V_{TT} = AC 1400 V, 10 s	
V_R = AC 1100 V				v_s = 2300 V				V_{TC} = AC 3300 V, 10 s	
1	40	1000	2500	2.5	30	64.2 × 64	1	250	B25855-C8105K004
1.5	40	1500	3800	1.8	30	64.2 × 64	1	250	B25855C8155K004
2	40	1400	3500	2.4	30	64.2 × 76	1	300	B25855C8205K004
2.5	40	1000	2500	4.1	30	64.2 × 97	1	400	B25855C8255K004
3	40	1200	3000	3.5	30	64.2 × 97	1	400	B25855C8305K004
4	40	1600	4000	2.8	30	64.2 × 97	1	400	B25855C8405K004
5	80	2000	5000	2.3	30	79.2 × 97	2	600	B25855C8505K004
7.5	80	3000	7500	1.7	30	79.2 × 97	2	600	B25855C8755K004
10	80	4000	10000	1.4	30	89.3 × 97	2	750	B25855C8106K004
20	120	8000	20000	0.9	30	121.6 × 97	3	1400	B25855C8206K004
40	120	8000	20000	1.5	50	121.6 × 163	3	2300	B25855C8406K004
V_{RDC} = AC 1700 V				$\hat{v}$ = 2000 V				V_{TT} = AC 1800 V, 10 s	
V_R = AC 1400 V				v_s = 2900 V				V_{TC} = AC 3900 V, 10 s	
0.5	40	700	1800	3.5	30	64.2 × 64	1	250	B25855C0504K004
0.75	40	1100	2600	2.5	30	64.2 × 64	1	250	B25855C0754K004
1	40	1400	3500	2.0	30	64.2 × 64	1	250	B25855C0105K004
1.5	40	1500	3800	2.4	30	64.2 × 76	1	300	B25855C0155K004
2	80	2000	5000	1.9	30	79.2 × 76	2	450	B25855C0205K004
2.5	80	2500	6300	1.6	30	79.2 × 76	2	450	B25855C0255K004
3	80	3000	7500	1.4	30	79.2 × 76	2	450	B25855C0305K004
4	80	4000	10000	1.2	30	89.3 × 76	2	600	B25855C0405K004
5	80	3000	7500	1.8	30	79.2 × 97	2	600	B25855C0505K004
7.5	80	4500	11000	1.4	30	99.3 × 97	2	900	B25855C0755K004
10	120	6000	15000	1.1	30	121.6 × 97	3	1400	B25855C0106K004
20	120	6000	15000	2.0	50	121.6 × 163	3	2300	B25855C0206K004

1) Other capacitance values upon request

Characteristics and ordering codes

C_R[1)]	I_{max}	$\hat{i}$	I_s	R_S 20 °C	L_{self}	Dimensions d × l	Fig.	Appr. weight	Ordering code
µF	A	A	A	mΩ	nH	mm		g	
V_{RDC} = AC 2000 V				$\hat{v}$ = 2400 V				V_{TT} = AC 2200 V, 10 s	
V_R = AC 1700 V				v_s = 3500 V				V_{TC} = AC 4400 V, 10 s	
0.5	40	900	2300	2.9	30	64.2 × 64	1	250	B25855C4504K004
0.75	40	1400	3400	2.1	30	64.2 × 64	1	250	B25855C4754K004
1	40	1200	3000	2.8	30	64.2 × 76	1	300	B25855C4105K004
1.5	80	1800	4500	2.0	30	79.2 × 76	2	450	B25855C4155K004
2	80	2400	6000	1.6	30	79.2 × 76	2	450	B25855C4205K004
2.5	80	3000	7500	1.4	30	89.3 × 76	2	600	B25855C4255K004
3	80	2400	6000	2.3	30	79.2 × 97	2	600	B25855C4305K004
4	80	3200	8000	1.8	30	89.3 × 97	2	750	B25855C4405K004
5	80	4000	10000	1.6	30	99.3 × 97	2	900	B25855C4505K004
7.5	120	6000	15000	1.0	30	121.6 × 97	3	1400	B25855C4755K004
10	120	8000	20000	1.6	30	121.6 × 97	3	1400	B25855C4106K004
20	120	7200	18000	1.7	50	121.6 × 163	3	2300	B25855C4206K004
V_{RDC} = AC 2500 V				$\hat{v}$ = 3000 V				V_{TT} = AC 2700 V, 10 s	
V_R = AC 2100 V				v_s = 4300 V				V_{TC} = AC 5400 V, 10 s	
0.5	40	1200	3000	2.9	30	64.2 × 76	1	300	B25855C1504K004
0.75	80	1800	4500	2.1	30	79.2 × 76	2	450	B25855C1754K004
1	80	2400	6000	1.7	30	79.2 × 76	2	450	B25855C1105K004
1.5	80	3600	9000	1.3	30	89.3 × 76	2	600	B25855C1155K004
2	80	2800	7000	1.9	30	89.3 × 97	2	750	B25855C1205K004
2.5	80	3500	8800	1.6	30	89.3 × 97	2	750	B25855C1255K004
3	80	4200	11000	1.4	30	99.3 × 97	2	900	B25855C1305K004
4	120	5600	14000	1.2	30	121.6 × 97	3	1400	B25855C1405K004
5	120	7000	18000	1.0	30	121.6 × 97	3	1400	B25855C1505K004
7.5	120	6800	17000	1.8	50	121.6 × 163	3	2300	B25855C1755K004
10	120	9000	23000	1.5	50	121.6 × 163	3	2300	B25855C1106K004
20	120	8000	20000	2.2	70	121.6 × 231	3	3200	B25855C1206K004

1) Other capacitance values upon request

Characteristics and ordering codes

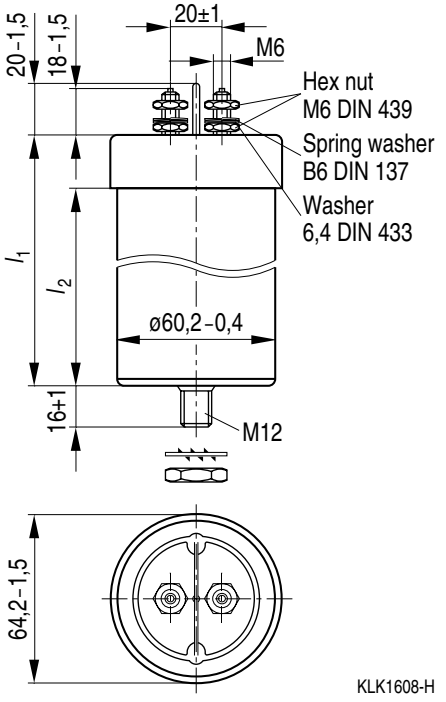
C_R[1)]	I_{max}	î	I_s	R_S 20 °C	L_{self}	Dimensions d × l	Fig.	Appr. weight	Ordering code
µF	A	A	A	mΩ	nH	mm		g	
V_{RDC} = AC 3000 V				$\hat{v}$ = 3600 V				V_{TT} = AC 3200 V, 10 s	
V_R = AC 2500 V				v_s = 5200 V				V_{TC} = AC 6200 V, 10 s	
0.5	80	1500	3800	2.1	30	79.2 × 76	2	450	B25855C7504K004
0.75	80	2300	5600	1.7	30	79.2 × 76	2	450	B25855C7754K004
1	80	3000	7500	1.4	30	89.3 × 76	2	600	B25855C7105K004
1.5	80	2700	6800	2.0	30	89.3 × 97	2	750	B25855C7155K004
2	80	3600	9000	1.6	30	89.3 × 97	2	750	B25855C7205K004
2.5	80	4500	11000	1.4	30	99.3 × 97	2	900	B25855C7255K004
3	120	5400	14000	1.2	30	121.6 × 97	3	1400	B25855C7305K004
4	120	7200	18000	1.0	30	121.6 × 97	3	1400	B25855C7405K004
5	120	8500	21000	1.3	35	121.6 × 123	3	1700	B25855C7505K004
7.5	120	7500	19000	1.6	50	121.6 × 163	3	2300	B25855C7755K004
10	120	5000	13000	3.0	70	121.6 × 231	3	3200	B25855C7106K004
15	120	7500	19000	2.2	70	121.6 × 231	3	3200	B25855C7156K004
V_{RDC} = AC 3300 V				$\hat{v}$ = 4000 V				V_{TT} = AC 3500 V, 10 s	
V_R = AC 2800 V				v_s = 5800 V				V_{TC} = AC 6800 V, 10 s	
0.5	80	1800	4400	2.1	35	79.2 × 76	2	450	B25855C3504K004
0.75	80	2600	6600	1.6	35	89.3 × 76	2	600	B25855C3754K004
1	80	2100	5300	2.5	35	79.2 × 97	2	600	B25855C3105K004
1.5	80	3200	7900	1.8	35	89.3 × 97	2	750	B25855C3155K004
2	120	4200	11000	1.5	35	121.6 × 97	3	1400	B25855C3205K004
2.5	120	5300	13000	1.3	35	121.6 × 97	3	1400	B25855C3255K004
3	120	6300	16000	1.1	35	121.6 × 97	3	1400	B25855C3305K004
4	120	8000	20000	1.3	40	121.6 × 123	3	1700	B25855C3405K004
5	120	6000	15000	2.0	60	121.6 × 163	3	2300	B25855C3505K004
7.5	120	4500	11000	3.3	80	121.6 × 231	3	3200	B25855C3755K004
10	120	6000	15000	2.7	80	121.6 × 231	3	3200	B25855C3106K004

Characteristics and ordering codes

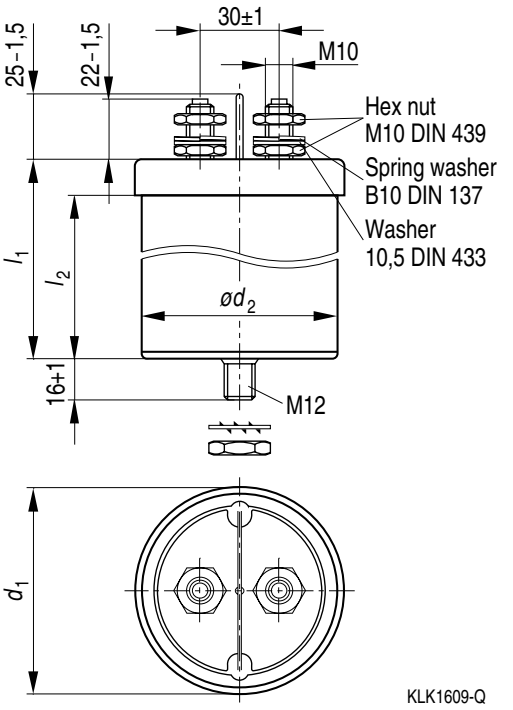
C_N[1)]	I_{max}	$\hat{i}$	I_s	R_S 20 °C	L_{self}	Dimensions $d \times l$	Fig.	Appr. weight	Ordering code
µF	A	A	A	mΩ	nH	mm		g	
V_{RDC} = AC 4000 V				$\hat{v}$ = 4800 V				V_{TT} = AC 4300 V, 10 s	
V_R = AC 3400 V				v_s = 7000 V				V_{TC} = AC 7800 V, 10 s	
0.5	80	1800	4400	3.1	35	79.2 × 99	2	600	B25855C2504K004
0.75	80	2600	6600	2.2	35	89.3 × 99	2	750	B25855C2754K004
1	80	2500	6300	2.9	40	89.3 × 123	2	1000	B25855C2105K004
1.5	80	3800	9400	2.2	40	99.3 × 123	2	1200	B25855C2155K004
2	80	3000	7500	3.4	60	89.3 × 163	2	1200	B25855C2205K004
2.5	80	3800	9400	2.8	60	99.3 × 163	2	1500	B25855C2255K004
3	80	4500	11000	2.4	60	99.3 × 163	2	1500	B25855C2305K004
4	120	6000	15000	2.0	60	121.6 × 163	3	2300	B25855C2405K004
5	120	7000	18000	2.6	80	121.6 × 231	3	3200	B25855C2505K004

1) Other capacitance values upon request

Dimensional drawing 1



Dimensional drawing 2



Dimensions in mm

l_1 –4	$l_{2\,min}$	Creepage distance	Clearance
64	44	35	14
76	56	35	14
97	77	35	14
Max. torque terminals[1]: 2 Nm			

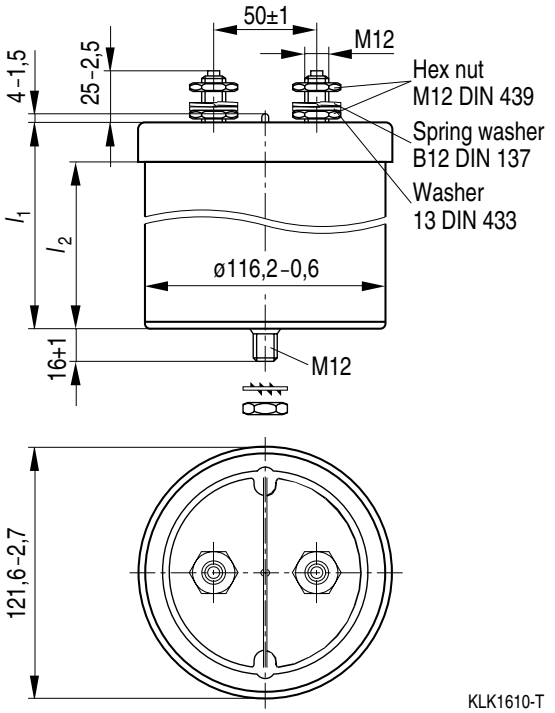
∅ d_1 –1.5	l_1 –4	l_2 min	∅ d_2 –0.4	Creepage distance	Clearance
64.2	64	38	60.2	35	14
	76	38			
	97	38			
79.2	76	54	75.2	42	20
	97	71			
	99	73			
89.3	76	54	85.2	50	20
	97	71			
	99	73			
	123	97			
	163	137			
99.3	97	71	95.2	55	20
	123	97			
	163	137			
Max. torque terminals[1]: 2 Nm					

[1]) The terminal torque must not act upon the cover. So the lead should be locked between two nuts.

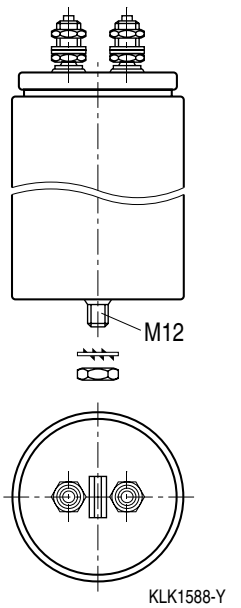
Mounting parts (included in delivery)

Threaded bolt	Max. torque	Toothed washer	Hex nut
M12	10 Nm	J 12,5 DIN 6797	M12 ISO 4035

Dimensional drawing 3



Version in high-grade, freon-resistant steel case



Dimensions in mm

l_1 –4	$l_{2\ min}$
97	71
123	97
163	137
231	205

Diameter (mm)	Length (mm)
85	137
85	161
116	234

Other case dimensions upon request.

Creepage distance 42 mm
Clearance 28 mm
Max. torque terminal*) 10 Nm

*) The terminal torque must not act upon the cover. So the lead should be locked between two nuts.

Mounting parts (included in delivery)

Threaded bolt	Max. torque	T
M12	10 Nm	J

Cautions and warnings

Safety

- 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 oil leakage.
- 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.
- Failure to follow cautions may result, worst case, in premature failures, bursting and fire.

Thermal load

After installation of the capacitor it is necessary to verify that maximum hot-spot temperature is not exceeded at extreme service conditions (see www.epcos.com/thermal_design).

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.

Overpressure disconnector

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

- The elastic elements must not be hindered, i.e.
  - connecting lines must be flexible leads (cables),
  - there must be sufficient space (minimum 12 mm) above the connections for expansion of the overpressure disconnector,
  - folding crimps must not be retained by clamps.
- 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 passive 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 a passive 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 a passive 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). 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.
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