

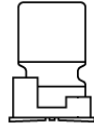


# **Aluminum electrolytic capacitors**

## Alu-X product lines

SMD capacitors

**Series/Type:**            **B41142**  
**Date:**                      August 2008

**Long-life grade capacitors**

**Applications**

- Low impedance applications

**Features**

- Very low impedance
- RoHS-compatible
- Load life of 3000 hours at 105 °C (∅ 6.3 × 7.7: 2000 hours)

**Construction**

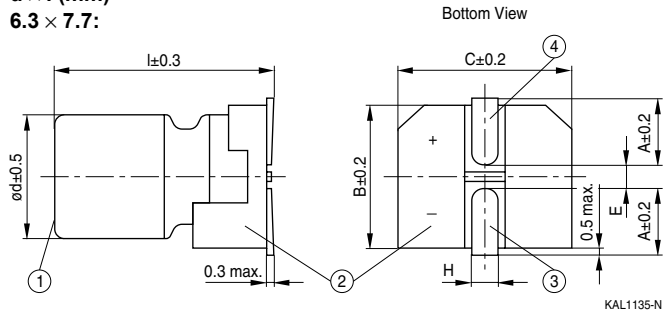
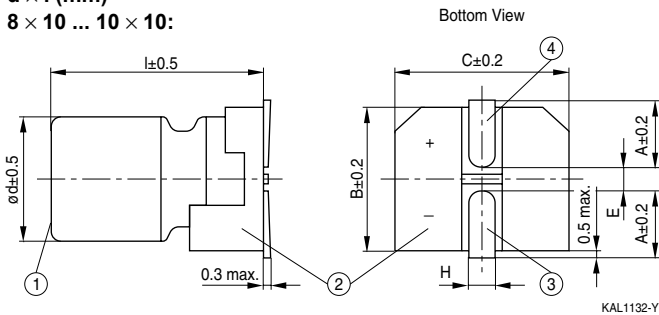
- Surface mounting device
- Minus pole marking on the case

**Delivery mode**

- Taped and reeled

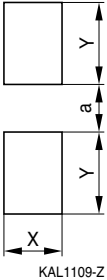
**Specifications and characteristics in brief**

Rated voltage $V_R$	6.3 ... 35 V DC					
Operating temperature range	-55 °C ... +105 °C					
Rated capacitance $C_R$ (20 °C, 120 Hz)	47 ... 1500 $\mu$ F					
Capacitance tolerance	$\pm 20\% \triangleq M$					
Load life (105 °C, $V_R$ )	3000 h $\varnothing 6.3 \times 7.7$ : 2000 hours	Requirements: $\Delta C/C \leq \pm 30\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit				
Leakage current $I_{leak}$ (20 °C, after 2 minutes)	$I_{leak} \leq 0.01 \mu A \cdot \left( \frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$ or 3 $\mu A$ , whichever is greater					
Low temperature stability (impedance ratio) (120 Hz)	$V_R$ (V DC)	6.3	10	16	25	35
	$\frac{Z(-25 \text{ }^\circ\text{C})}{Z(+20 \text{ }^\circ\text{C})}$	2	2	2	2	2
	$\frac{Z(-40 \text{ }^\circ\text{C})}{Z(+20 \text{ }^\circ\text{C})}$	4	4	4	3	3
Shelf life	After storage for 1000 h at 105 °C, the capacitors shall meet the requirement of load life test after reforming process. After test: $V_R$ to be applied for 30 minutes, 24 to 48 hours before measurement.					
Frequency multiplier for rated ripple current	50 Hz	120 Hz	300 Hz	1 kHz	$\geq 10$ kHz	
	0.35	0.50	0.64	0.83	1.00	

**Dimensional drawing**
 **$d \times l$  (mm)**
 **$6.3 \times 7.7$ :**

 **$d \times l$  (mm)**
 **$8 \times 10 \dots 10 \times 10$ :**


①	Case
②	Terminal base board
③	Minus pole
④	Plus pole

Case dimensions $d \times l$ (mm)	$6.3 \times 7.7$	$8 \times 10$	$10 \times 10$
A	2.4	2.9	3.2
B	6.6	8.3	10.3
C	6.6	8.3	10.3
E	2.2	3.1	4.5
H	0.5 ... 0.8	0.8 ... 1.1	

**Layout recommendation**


$d \times l$ (mm)	X	Y	a
$6.3 \times 7.7$	1.6	3.5	2.1
$8.0 \times 10.0$	2.5	3.5	3.0
$10.0 \times 10.0$	2.5	4.0	4.0

**Overview of available types**

$V_R$ (V DC)	6.3	10	16	25	35
	Case dimensions $d \times l$ (mm)				
$C_R$ ( $\mu\text{F}$ )					
47					$6.3 \times 7.7$
100		$6.3 \times 7.7$	$6.3 \times 7.7$	$6.3 \times 7.7$	$8 \times 10$
150		$6.3 \times 7.7$	$6.3 \times 7.7$	$8 \times 10$	$8 \times 10$
220	$6.3 \times 7.7$	$6.3 \times 7.7$	$6.3 \times 7.7$	$8 \times 10$	$8 \times 10$
330	$6.3 \times 7.7$	$8 \times 10$	$8 \times 10$	$8 \times 10$	$10 \times 10$
470	$8 \times 10$	$8 \times 10$	$8 \times 10$	$10 \times 10$	
680	$8 \times 10$	$10 \times 10$	$10 \times 10$		
1000	$8 \times 10$	$10 \times 10$			
1500	$10 \times 10$				

**Technical data and ordering codes**

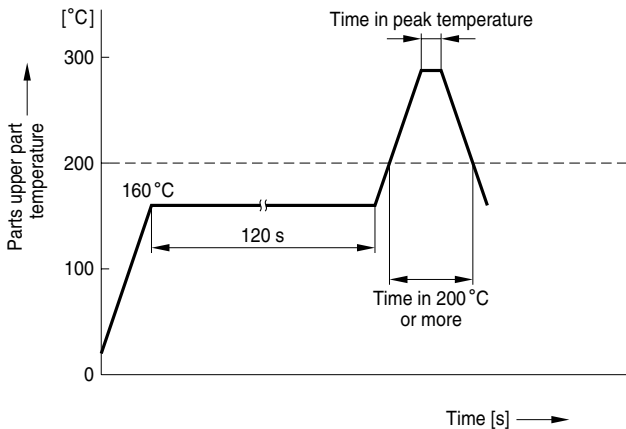
$V_R$	$C_R$ 120 Hz 20 °C V DC $\mu\text{F}$	Case dimensions $d \times l$ mm	$\tan \delta_{\max}$ 120 Hz 20 °C	$Z_{\max}$ 100 kHz 20 °C $\Omega$	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code
6.3	220	6.3 × 7.7	0.26	0.26	300	B41142A2227M000
	330	6.3 × 7.7	0.26	0.26	300	B41142A2337M000
	470	8 × 10	0.26	0.16	600	B41142A2477M000
	680	8 × 10	0.26	0.16	600	B41142A2687M000
	1000	8 × 10	0.26	0.16	600	B41142A2108M000
	1500	10 × 10	0.26	0.08	850	B41142A2158M000
10	100	6.3 × 7.7	0.20	0.26	300	B41142A3107M000
	150	6.3 × 7.7	0.20	0.26	300	B41142A3157M000
	220	6.3 × 7.7	0.20	0.26	300	B41142A3227M000
	330	8 × 10	0.20	0.16	600	B41142A3337M000
	470	8 × 10	0.20	0.16	600	B41142A3477M000
	680	10 × 10	0.20	0.08	850	B41142A3687M000
	1000	10 × 10	0.20	0.08	850	B41142A3108M000
	16	100	6.3 × 7.7	0.16	0.26	300
150		6.3 × 7.7	0.16	0.26	300	B41142A4157M000
220		6.3 × 7.7	0.16	0.26	300	B41142A4227M000
330		8 × 10	0.16	0.16	600	B41142A4337M000
470		8 × 10	0.16	0.16	600	B41142A4477M000
680		10 × 10	0.16	0.08	850	B41142A4687M000
25		100	6.3 × 7.7	0.14	0.26	300
	150	8 × 10	0.14	0.16	600	B41142A5157M000
	220	8 × 10	0.14	0.16	600	B41142A5227M000
	330	8 × 10	0.14	0.16	600	B41142A5337M000
	470	10 × 10	0.14	0.08	850	B41142A5477M000
35	47	6.3 × 7.7	0.12	0.26	300	B41142A7476M000
	100	8 × 10	0.12	0.16	600	B41142A7107M000
	150	8 × 10	0.12	0.16	600	B41142A7157M000
	220	8 × 10	0.12	0.16	600	B41142A7227M000
	330	10 × 10	0.12	0.08	850	B41142A7337M000

## Soldering

### Recommended conditions

For reflow, use thermal conduction systems such as infrared radiation (IR) or hot blast. Vapor heat transfer systems (VPS) are not recommended.

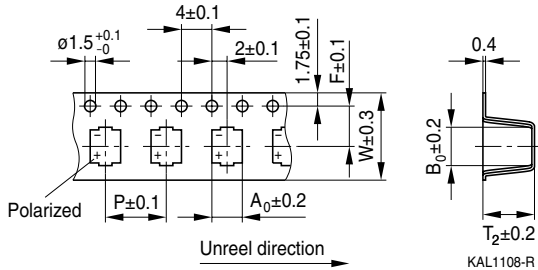
- Observe proper soldering conditions (temperature, time, etc.).
- Do not exceed the specified limits.
- Temperature measuring method: Measure temperature in assuming quantitative production, by sticking the thermo-couple to the capacitor upper part with epoxy adhesives.
- Consult use for additional reflow restrictions.



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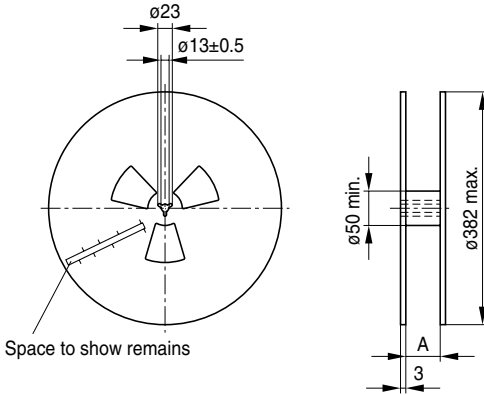
### Lead-free reflow

d (mm)	4 ... 6.3	8 ... 10
Peak temperature	250 °C	235 °C
Time in peak temperature	5 s	5 s
Time in 200 °C or more	60 s	60 s
Time of reflow	1 time	1 time

**Taping of SMD capacitors**


Case dimensions $d \times l$ (mm)	4 × 5.4	4 × 5.8	5 × 5.4	5 × 5.8	6.3 × 5.4
W	12.0	12.0	12.0	12.0	16.0
P	8.0	8.0	12.0	12.0	12.0
F	5.5	5.5	5.5	5.5	7.5
$A_0$	5.0	5.0	6.0	6.0	7.0
$B_0$	5.0	5.0	6.0	6.0	7.0
$T_2$	5.8	6.3	5.8	6.3	5.8

Case dimensions $d \times l$ (mm)	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 10
W	16.0	16.0	16.0	24.0	24.0
P	12.0	12.0	12.0	16.0	16.0
F	7.5	7.5	7.5	11.5	11.5
$A_0$	7.0	7.0	8.7	8.7	10.7
$B_0$	7.0	7.0	8.7	8.7	10.7
$T_2$	6.3	8.2	6.8	11.0	11.0

**Reel packing**


KAL1110-3

Capacitor dimensions $d \times l$ (mm)	Quantity per reel pcs.
$4 \times l$	2000 pcs.
$5 \times l, 6.3 \times l, 8 \times 6.2$	1000 pcs.
$8 \times 10, 10 \times l$	500 pcs.

$d \times l$ (mm)	$4 \times l, 5 \times l$	$6.3 \times l, 8 \times 6.2$	$8 \times 10, 10 \times l$
A	14	18	26



## Cautions and warnings

### General

Also see "Important notes" on page 11.

- 1 Aluminum electrolytic capacitors have a bi-polar structure. This is marked on the body of the capacitor. A capacitor must not be mounted with reversed polarity. The application of an AC or reverse voltage may cause a short circuit or damage the capacitor. Bi-polar capacitors must not be used in AC applications, where the polarity may be reversed in the circuits or is unknown.
- 2 The DC voltage applied to the capacitor terminal must not exceed its rated operating voltage, as this will result in a rapid increase of the leakage current and may damage the capacitor. It is recommended to operate the capacitor at 70–80% of its rated voltage to optimize its service life.
- 3 The ripple current applied to the capacitor must be within the permitted range. An excessive ripple current leads to impaired electrical properties and may damage the capacitor. Note that the sum of the peak values of the ripple voltage and the DC operating voltage must not exceed the rated DC voltage.
- 4 Capacitors must be used within their permitted range of operating temperature. Operation at room temperature optimizes their service life.
- 5 Capacitors with case diameter  $\geq 8$  mm are equipped with a safety vent. In capacitors fitted with a lead or soldering lug, the safety vent is usually located at the base of the case. It needs sufficient space around it to operate optimally. The following dimensions are recommended: for case diameter  $d = 8$  to 16 mm, more than 2 mm; for  $d = 18$  to 35 mm, more than 3 mm; and for  $d = 42$  mm or more, more than 5 mm.
- 6 Capacitors should not be mounted with the safety vent face down on the board. Do not locate any wire or copper trace near the safety vent. Do not reverse the voltage, as this may result in excess pressure and the leakage of electrolyte.
- 7 Gas is released through the safety vent when the pressure inside the capacitor is too high. A gaseous liquid around the safety vent does not indicate a leakage of electrolyte.
- 8 The capacitor should be stored under conditions of normal temperature and in a non-acid, non-alkali environment of normal humidity. Exposure to high temperatures, for example under direct sunlight, will reduce its operating life. If the capacitor is stored in an environment containing acids or alkalis, the solderability of the leads may be affected.
- 9 The leakage current of an aluminum electrolytic capacitor may increase after a long period of storage. After such storage, the capacitor must be aged by applying the rated operating voltage for 6–8 hours before use.
- 10 Manual soldering:
  - a Soldering must be performed within the specified conditions.  
Bit temperature: 350 °C; application time of soldering iron: 3 seconds.
  - b Ensure that the soldering iron does not touch any part of the capacitor body.

## Cautions and warnings

- 11 Do not apply excessive force to the leads and terminals. Do not move the capacitor after soldering it onto the PC board and do not carry the PC board by gripping the capacitor. Observe the following rules to prevent undue stress to the capacitor:
  - a Do not tilt or bend the capacitor after soldering.
  - b Ensure that the terminal spacing matches the corresponding hole spacing on the PC board.
- 12 The aluminum case is not insulated from the cathode. Do not place a conductor under the aluminum capacitors on the PC board as this may cause a short circuit. The case and top of capacitors used in switched mode power supplies have a high-voltage-resistant heat shrink sleeve to ensure safe usage.
- 13 The leads of capacitors with a case diameter exceeding 14 mm cannot be used for fixing.

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