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Cautions and warnings 注意和警告

General

Also see "Important notes" on page 2.

- 1 Aluminum electrolytic capacitors have a bipolar 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.
- 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 ≥ 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 $d = 40$ 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.

概述

请参阅P2 “重要事项”。

- 1 铝电解电容器为两极性结构（参见电容器体上的标志），安装时需注意极性，不得装反。交流电或反向电压的应用可能会导致短路或损坏电容器。
- 2 加载至电容器终端的直流电压不得超过其额定工作电压，否则将导致漏电流迅速增加，并因此损坏电容器。为延长产品使用寿命，建议以70-80%的额定电压使用电容器。
- 3 加载至电容器的纹波电流必须在允许范围内，如超载，将致使电气性能受损，并因此损坏电容器。请注意，纹波电压和直流工作电压峰值的总和不得超过额定直流电压。
- 4 电容器必须在其工作温度容许范围内使用。室温工作条件可延长使用寿命。
- 5 壳体直径大于等于8 mm的电容器均配有一个安全阀。在引线式或焊片式电容器中，安全阀通常位于壳体底部。该阀周围需要保留足够的空间，以保持最佳工作状态。推荐尺寸有以下几种：壳体直径 $d = 8 \sim 16$ mm时，保留2 mm以上空间； $d = 18 \sim 35$ mm时，保留3 mm以上空间； $d = 40$ mm或以上时，保留5 mm以上空间。
- 6 安装电容器于电路板时，注意安全阀不要面朝下，切勿在安全阀附近走任何金属或铜导线。不要反转电压，否则可能会导致压力过大、电解液发生泄漏。

Cautions and warnings 注意和警告

- 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.
- 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.
- 7 当电容器内部压力过高时，气体将通过安全阀释放，导致安全阀周围出现气态液体，该液体并非泄漏的电解液。
- 8 电容器应在常温及非酸性、非碱性的正常湿度环境中存放。如暴露于高温，例如在直射阳光下，会降低其使用寿命。如在酸性或碱性环境中存放，将会影响引线的可焊性。
- 9 经过长期存储，铝电解电容器的漏电流可能会增加。因此，在使用前，必须施加6-8小时的额定工作电压进行化成。
- 10 手工焊接：
 - a 必须在规定的条件下进行。
温度：350 °C；烙铁使用时间：3秒。
 - b 确保烙铁不会碰到电容器本体的任何部位。
- 11 在引线和终端处切勿用力过度。在电容器焊至PCB板后，请勿移动电容器或通过紧握电容器来移动PCB板。请遵守以下规则，以防给电容器造成过大压力：
 - a 在焊接后，请勿倾斜或弯曲电容器。
 - b 确保产品引出线间距与PCB板上焊接点位间距匹配。
- 12 铝质壳体与阴极并未隔离，因此请勿在PCB板上的铝电容器下放置任何导体，否则可能会导致短路。开关电源用电容器的壳体和顶端设有一个耐高压热收缩套管，可确保使用安全。

1 **Basic construction of Aluminum electrolytic capacitors**

Aluminum electrolytic capacitors, which will be abbreviated to "Al electrolytic capacitors" in the following, assume a special position among the various types of capacitors since their principle of operation relies, in part, on electrochemical processes.

The advantages of Al electrolytic capacitors that have led to their wide application range are their high volumetric efficiency (i.e. capacitance per unit volume), which enables the production of capacitors with up to one Farad capacitance, and the fact that an Al electrolytic capacitor provides a high ripple current capability together with a high reliability and an excellent price/performance ratio.

As is the case with all capacitors, an Al electrolytic capacitor comprises two electrically conductive material layers that are separated by a dielectric layer. One electrode (the anode) is formed by an aluminum foil with an enlarged surface area. The oxide layer (Al_2O_3) that is built up on this is used

as the dielectric. In contrast to other capacitors, the counter electrode (the cathode) of Al electrolytic capacitors is a conductive liquid, the operating electrolyte. A second aluminum foil, the so-called cathode foil, serves as a large-surfaced contact area for passing current to the operating electrolyte.

1 **铝电解电容器的基本结构**

由于铝电解电容器的工作原理部分依赖于电化学工艺，因此该产品在各系列电容器中占有特殊位置。

基于高体积效率（即每单位体积电容）的优势，铝电解电容器得以广泛应用，该特点不仅使产品容量高达法拉，而且还能承受很大的纹波电流，除此之外，产品质量可靠、性价比优越。

与其它电容器相同，铝电解电容器有两个导电电极，中间由绝缘层隔开。其中，一个电极（阳极）由扩展了表面积的铝箔形成，氧化层（ Al_2O_3 ）在其表面形成绝缘层。与其它电容器不同的是，铝电解电容器的对电极（阴极）为导电液体——工作电解液。另一层铝箔，即所谓的阴极箔，具有更大接触面积，可将电流传送至电解液。

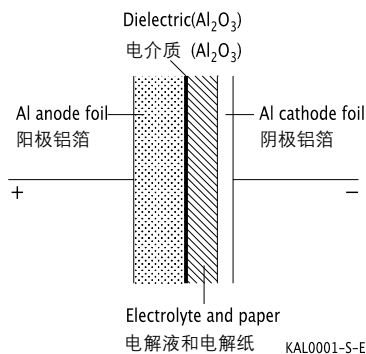


Figure 1
Basic construction of an aluminum electrolytic capacitor
图1
铝电解电容器的基本结构

$$C = \epsilon_0 \cdot \epsilon_r \cdot \frac{A}{d}$$

C	Capacitance 电容量	F
ϵ_0	Absolute permittivity 绝对电容率	As/Vm
ϵ_r	Relative permittivity 相对电容率	(9.5 for Al_2O_3)
A	Capacitor electrode surface area 电容器电极表面积	m^2
d	Electrode spacing 电极间隔	m

The anode of an Al electrolytic capacitor is an aluminum foil of extreme purity. The effective surface area of this foil is greatly enlarged (by a factor of up to 200) by electrochemical etching in order to achieve the maximum possible capacitance values. The type of etch pattern and the degree of etching is matched to the respective requirements by applying specific etching processes.

Etched foils enable very compact Al electrolytic capacitor dimensions to be achieved and are the form used almost exclusively nowadays. The electrical characteristics of Al electrolytic capacitors with plain (not etched) foils are, in part, better, but these capacitors are considerably larger and are only used for special applications nowadays.

铝电解电容器的阳极纯度极高的铝箔，其有效表面积通过电化学腐蚀得到大幅度扩展（比例达200倍），从而可获得最大可能电容值。腐蚀方式及程度不同，这取决于具体工艺要求。

腐蚀箔实现了非常紧凑的铝电解电容器尺寸，几乎是当前采用的唯一形式。在某种程度上，采用原箔（非腐蚀箔）的铝电解电容器的电气特性更好，但相关电容器体积较大，目前仅限于一些特殊应用。

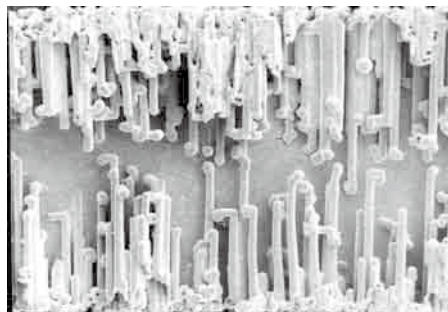


Figure 2
Anode foil for high-voltage capacitors (magnification 400x)
图2
高压电容器用阳极箔（放大400倍）

The dielectric layer of an Al electrolytic capacitor is created by anodic oxidation (forming) to generate an aluminum oxide layer on the foil. The layer thickness increases in proportion to the forming voltage at a rate of approximately 1.2 nm/V. Even for capacitors for very high voltages, layer thicknesses of less than 1 μm are attained, thus enabling very small electrode spacings. This is one reason for the high volumetric efficiency achieved (e.g. in comparison to the minimum thickness of a paper dielectric, 6 to 8 μm).

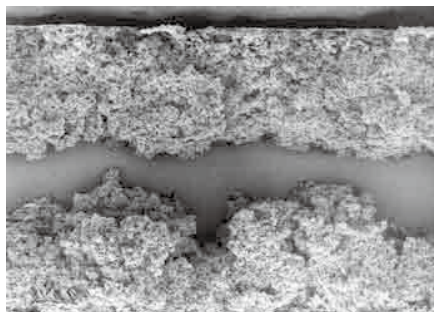


Figure 3
Anode foil for low-voltage capacitors (magnification 400x)
图3
低压电容器用阳极箔（放大400倍）

铝电解电容器的绝缘层由阳极氧化形成（化成），在铝箔上生成氧化铝层，层的厚度随化成电压的增长而增加，其比率近1.2 nm/V。即使是非常耐高压的电容器，其氧化层也不会超过1 μm ，从而可实现极小的电极间隔。此即为实现高体积效率的原因之一（相比较而言，纸绝缘层的最小厚度为6~8 μm ）。

During the forming process the very fine pits of the etched foils will encrust partially in proportion to the forming voltage and thus also to the achieved layer thickness. Due to this effect, the final operating voltage range must already be taken into account when the foils are etched.

The oxide layer constitutes a voltage-dependent resistance that causes the current to increase more steeply as the voltage increases. A characteristic curve as shown in figure 4 is obtained.

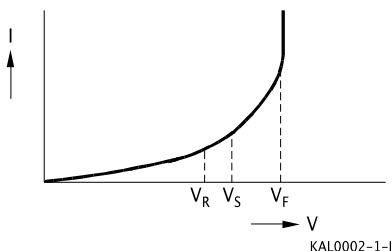


Figure 4
Current-voltage characteristic of an Al electrolytic capacitor
图4
铝电解电容器的电流电压特性

When the forming voltage V_F is exceeded, the forming process starts a new and large amounts of gas and heat are generated. The same effect, yet on a smaller scale, can already be observed in the knee of the curve. In order to achieve a high degree of operating safety of the capacitor, the rated voltage V_R is defined as being on the quasi-linear part of the curve. As the capacitor is subjected to surge voltages V_S for short periods only, this range lies between the rated voltage and the forming voltage. The difference between forming voltage and operating voltage, the so-called overanodization, thus has a substantial effect on the operating reliability of the capacitor. High overanodization offers the possibility of producing especially reliable capacitors designated as long-life grade "LL" capacitors to IEC 60384-1.

Since the electrolytic capacitors have a liquid as a cathode, they are also designated as "wet" or "non-solid" capacitors. The liquid has the advantage that it fills the fine etching pits, therefore optimally fitting into the anode structure.

在化成过程中，腐蚀箔上的细小凹陷的结壳厚度会部分受到化成电压的影响。基于这一效应，在腐蚀铝箔时，必须考虑最终工作电压范围。

氧化层的绝缘性随电压变化而变化，致使电流随电压的增加而出现陡峭的增幅，形成图4所示特性曲线图。

V_R = Rated voltage	额定电压
V_S = Surge voltage	浪涌电压
V_F = Forming voltage	化成电压

当超过化成电压 V_F 时，化成过程会产生新的大量的气体，从而产生热量。前面曲线图中的弯曲处也反映了同一现象。为实现电容器的高可靠性运行，额定电压 V_R 定义为曲线准线性部分对应电压。由于电容器仅在短时期内受浪涌电压 V_S 影响，因此 V_S 便介于额定电压和化成电压之间。化成电压与工作电压的差额即所谓的过阳极化，对电容器的可靠性产生正面影响。高度过阳极化使得高度稳定电容器（符合IEC 60384-1长寿命级别）的产生成为可能。

由于铝电解电容器的阴极为液体，它们也被称作“湿”或“非固体”电容器。电解液的优势在于其能够充斥腐蚀凹痕，从而与阳极结构完美结合。

The two aluminum foils are separated by paper spacers. The paper serves various purposes, it serves as a container for the electrolyte – the electrolyte is stored in the pores of the absorbent paper – and also as a spacer to prevent electric short-circuits, as well as ensuring the required dielectric strength between the anode and cathode foils.

两层铝箔由电解纸绝缘隔开，该电解纸在此充当不同角色，它既是电解液的容器——电解液存于吸水纸空隙——又可预防电气短路，还可以保证阳极箔和阴极箔之间所需的绝缘强度。

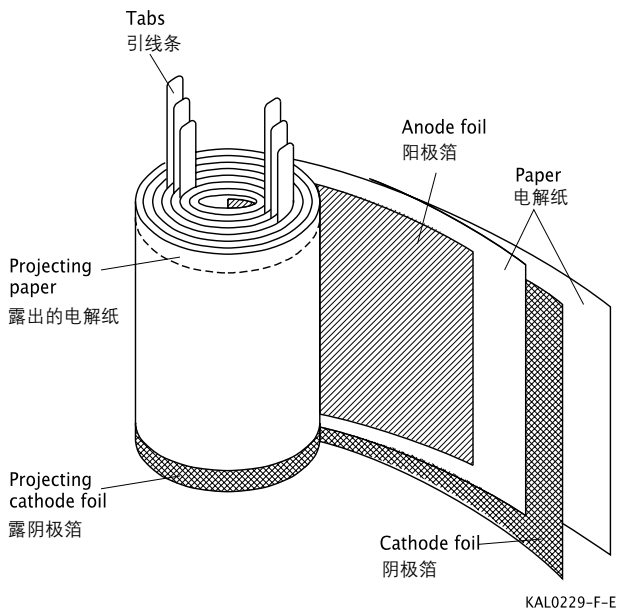


Figure 5

Winding construction of an Al electrolytic capacitor

图5

铝电解电容器的卷绕结构

An Al electrolytic capacitor constructed in the way described above will only operate correctly if the positive pole is connected to the formed Al foil (or anode), and the negative pole to the cathode foil. If the opposite polarity were to be applied, this would cause an electrolytic process resulting in the formation of a dielectric layer on the cathode foil. In this case strong internal heat generation and gas emission may occur and destroy the capacitor. Secondly, the cathode capacitance,

上述铝电解电容器仅当连接正确时方可正常工作，电压正极需连至化成铝箔（或阳极），且负极连至阴极箔时。如果接反，将导致电化学过程，并导致阴极箔上化成绝缘层。在这种情况下，电容器内部会产生高热量，同时会散发气体，导致电容器损坏。其次，随着氧化层厚度的增加，与阳极电容串联的阴极电容容量将大幅度降低，从而会大幅减少总

which will progressively decrease as the oxide layer thickness increases, and which is connected in series with the anode capacitance, would reduce the overall capacitance considerably.

An electrolytic capacitor of the basic design described here is therefore only suitable for DC operation. The DC voltage may also be a ripple voltage, i.e. a DC voltage with a superimposed alternating voltage; the positive pole must be connected to the anode. Capacitors with this configuration are polar versions that can be used for most applications.

As already pointed out, polar capacitors do not tolerate a voltage reversal. Incorrect polarities of up to 1.5 V are, however, permissible for short periods of time as the formation of a damaging oxide layer on the cathode only starts at voltages of this magnitude. (This is because the cathode foil is covered by an air-oxide layer that corresponds to an anodized dielectric layer with a breakdown voltage of approximately 1.5 V.)

2 Standards and specifications

2.1 General-purpose grade and long-life grade capacitors

Al electrolytic capacitors are generally divided into two basic reliability categories: capacitors for high-reliability applications and capacitors for general-purpose applications. This differentiation has also been adopted in the relevant IEC standards.

In IEC publications Al electrolytic capacitors for high-reliability applications are identified as "Long-Life Grade" capacitors. The abbreviation LL is stamped on the capacitors. In addition to the over-anodization as described in chapter 1, further measures are taken to enhance the reliability. Generally, the materials used for Al electrolytic capacitors must meet strict purity requirements, and those used for producing LL grade capacitors must be specially selected. The design effort required for such capacitors affects both the case size and the price.

Al electrolytic capacitors for general applications are called "General-Purpose Grade" in IEC publications.

容量。

因此，具有上述基本结构的铝电解电容器仅适合直流应用。直流电压也许是个波形电压，即叠加了交流电压的直流电压，但电压正极必须连至阳极。这样的电容器为极性电容器，可用于大多数场合。

如上所述，极性电容器不支持电压反接。如果电压反接且电压值不超过1.5 V，可允许短期操作，因为破坏阴极氧化层的化成仅在电压达 1.5 V时才开始（原因是阴极箔上有一层水合氧化物，其击穿电压近1.5 V）。

2 标准和规格

2.1 通用级和长寿命级电容器

铝电解电容器通常分为两类：高可靠性应用类和通用类。这种区别也在有关IEC标准采用。

在IEC出版物中，高可靠性电容器称作“长寿命级（Long-Life Grade）”电容器（产品上贴有简写符号LL）。除章节1所述过阳极化外，还采取了进一步措施以加强可靠性。总体来说，铝电解电容器所用材料必须符合严格的纯度要求，而LL级电容器生产用材料还必须通过特殊挑选。LL系列电容器的特殊设计也将影响到壳体尺寸和成本。

在IEC出版物中，通用型铝电解电容器称作“通用级（General-Purpose Grade）”产品。

2.2 Applicable standards

The international standard for Al electrolytic capacitors is IEC 60384-4.

The sectional specification mentioned above is complemented by a set of detail specifications that applies to specific design types (e.g. electrolytic capacitors with axial wire leads). Frequently these detail specifications state better electrical ratings than the sectional specifications. The de- tail specifications also include maximum permissible dimensions in relation to capacitance and rated voltage.

The capacitance ratings given in recent specifications are in accordance with the E3 or E6 series. The rated voltage values are standardized according to the R5 series, in exceptional cases the voltage ratings have been chosen to meet specific requirements.

The following standards are applicable to Al electrolytic capacitors with a non-solid electrolyte:

IEC 60384-1	(identical with DIN EN 60384-1, EN 60384-1): Generic specification: Fixed capacitors for use in electronic equipment
IEC 60384-4	(identical with EN 60384-4): Sectional specification: Al electrolytic capacitors with solid and non-solid electrolyte
IEC 60384-4-1	(comparable with EN 130301): Blank detail specification: Al electrolytic capacitors with non-solid electrolyte

Important notes on proper use of Al electrolytic capacitors can also be found in CENELEC RE-PORT R040-001 "Guide for the application of aluminum electrolytic capacitors".

2.2 适用标准

铝电解电容器的国际标准是IEC 60384-4。

除上述部分规范外，还有一套具体标准做补充，这些具体标准用于特别设计（如轴向引线式电解电容器）。通常具体标准会比分规范更详细地描述电气特性。具体规范还包括最大允许尺寸及电容量和额定电压。

最新规格中给出的电容量额定值基于E3或E6系列。额定电压值依照R5系列加以标准化，在特殊情况下，为满足特定要求，常选用电压额定值。

下列标准适用于非固态铝电解电容器：

IEC 60384-1	(与DIN EN 60384-1、EN 60384-1相同)： 总规范： 电子设备用固定电容器
IEC 60384-4	(与EN 60384-4相同)： 分规范： 适用于固体和非固体铝电解电容器
IEC 60384-4-1	(与 EN 130301类似)： 空白详细规范： 非固体铝电解电容器

有关铝电解电容器的正确使用说明，可参见CENELEC RE- PORT R040-001的“铝电解电容器应用指南（Guide for the application of aluminum electrolytic capacitors）”

3 Definitions of electrical parameters

3.1 Voltages

3.1.1 Rated voltage V_R

The rated voltage V_R is the direct voltage value for which the capacitor has been designed and which is indicated upon it. For Al electrolytic capacitors, rated voltages of ≤ 100 V are usually designated as "low voltage" and rated voltages >100 V as "high voltage" (refer to chapter "General technical information, 15 Structure of the ordering code (part number)").

3.1.2 Operating voltage V_{op}

The capacitors can be operated continuously at full rated voltage (including superimposed AC voltage) within the entire operating temperature range.

The permissible voltage range for continuous operation lies between the rated voltage and 0V. For short periods of time, the capacitors can also handle voltages up to 1.5 V (refer to chapter "General technical information, 3.1.6 Reverse voltage").

3.1.3 Surge voltage V_S

The surge voltage is the maximum voltage which may be applied to the capacitor for short periods of time, i.e. up to 5 times for 1 minute per hour. IEC 60384-4 specifies the surge voltage as follows:

for $V_R \leq 315$ V: $V_S = 1.15 \cdot V_R$

for $V_R > 315$ V: $V_S = 1.10 \cdot V_R$

3.1.4 Transient voltage

Some capacitor types produced by 爱普科斯 can withstand voltage pulses exceeding the surge voltage V_S . As the requirements differ largely depending on the individual applications, we do not state general ratings but match the overvoltage capability to customer requirements.

3 电气参数定义

3.1 电压

3.1.1 额定电压 V_R

额定电压 V_R 是电容器设计可承受的直流电压值并标印于产品本体上。对于铝电解电容器，额定电压 ≤ 100 V 的通常叫做“低压”电容器，而额定电压 >100 V 的，则称作“高压”电容器（请参照“技术信息概要，15位，订购代码结构（料号）”）。

3.1.2 工作电压 V_{op}

电容器可以在整个额定电压（包括叠加交流电压）下、额定工作温度范围内连续工作。

持续工作允许的电压范围介于0V到额定电压之间。在短时间内，电容器还可以承受不超过1.5 V 的反向电压（参见章节“技术信息概要，3.1.6 反向电压”）。

3.1.3 浪涌电压

浪涌电压是短期内加载至电容器的最大电压，比如一小时内每分钟5次。IEC 60384-4定义浪涌电压如下：

如果 $V_R \leq 315$ V: $V_S = 1.15$ 倍 V_R

如果 $V_R > 315$ V: $V_S = 1.10$ 倍 V_R

3.1.4 瞬时电压

爱普科斯生产的一些电容器可承受超过浪涌电压 V_S 的电压脉冲。由于客户要求随应用的不同而不同，爱普科斯不声明一般额定值符合客户要求的过压能力。

3.1.5 Superimposed AC, ripple voltage

A superimposed alternating voltage, or ripple voltage, may be applied to Al electrolytic capacitors, provided that:

- the sum of the direct voltage and superimposed alternating voltage does not exceed the rated voltage, and
- the rated ripple current is not exceeded (refer to chapter "General technical information, 4 Ripple current considerations") and that no polarity reversal will occur.

3.1.6 Reverse voltage

Al electrolytic capacitors are polar capacitors. Where necessary, voltages of opposite polarity should be prevented by connecting a diode. The diode's conducting-state voltage of approximately 0.8 V is permissible. Reverse voltages ≤ 1.5 V are tolerable for a duration of less than 1 second, but not in continuous or repetitive operation.

3.2 Capacitance

3.2.1 AC and DC capacitance

The capacitance of a capacitor can be determined by measuring its AC impedance (taking into account amplitude and phase) or by measuring the charge it will hold when a direct voltage is applied. The two methods produce slightly different results. As a general rule, it can be said that DC voltage based measurements (DC capacitance) yield higher values (DC capacitance) than the alternating current method (AC capacitance). The factors are approximately 1.1 to 1.5 and maximum deviations occur with capacitors of low voltage ratings.

Corresponding to the most common applications (e.g. smoothing and coupling), it is most usual to determine the AC capacitance of Al electrolytic capacitors.

3.1.5 叠加的交流电压，纹波电压

加至铝电解电容器的叠加交流电压或纹波电压：

- 直流电压和叠加的交流电压之和不许超过额定电压；且
- 不得超出额定纹波电压（参见“技术信息概要，4：纹波电压因素”），而且不得反接极性。

3.1.6 反向电压

铝电解电容器为极性电容器，如果需要，应当连接一个二极管以保证电压不会接反。二极管的导通电压不得超过0.8 V。低于1.5 V的反向电压可施加不超过1秒钟，但不许连续施加或重复施加。

3.2 电容量

3.2.1 交流和直流电容量

电容器的电容量可通过测量其交流阻抗（考虑振幅和相位）或测量当施加直流电压时其保留的电荷来确定。两种方法产生的结果无甚差别。总体来说，基于直流电压的测量（直流电容量）值要高于基于交流电的测量值（交流电容量），具体比例约为1.1: 1.5，当进行低电压测量时，会产生最大差别。

在大多数应用下（例如平滑和耦合），一般是测量铝电解电容器的交流电容量。

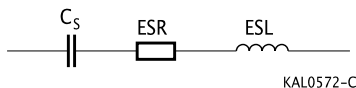


Figure 6 Simplified equivalent circuit diagram of an electrolytic capacitor

图6 铝电解电容器的简化等效电路图

For this purpose, the capacitive component of the equivalent series circuit (the series capacitance C_S) is determined by applying an alternating voltage of ≤ 0.5 V. As the AC capacitance depends on frequency and temperature, IEC 60384-1 and IEC 60384-4 prescribe a measuring frequency of 100 Hz or 120 Hz and a temperature of 20 °C (other reference values by special request).

There are also applications (e.g. discharge circuits and timing elements) in which the DC capacitance is decisive. In spite of this fact, capacitors for which the capacitance has been determined by the AC method are also used in such applications, whereby allowances are made to compensate for the difference between the two measuring methods.

However, in exceptional cases it may be necessary to determine the DC capacitance. The IEC publications do not provide any corresponding specifications. Because of this, a separate DIN standard has been defined. This standard, DIN 41328-4, describes a measuring method involving one-time, non-recurrent charging and discharging of the capacitor.

3.2.2 Rated capacitance C_R

The rated capacitance is the AC capacitance value for which the capacitor has been designed and which is indicated upon it. C_R is determined by specific measurement methods described in the relevant standards (IEC 60384-1 and IEC 60384-4). Preferred capacitance values are taken from the E3 or E6 series.

EPCOS specifies C_R in μF as the AC capacitance measured at 100 Hz or 120 Hz and 20 °C, to IEC 60384-4.

为此，等效串联线路（串联电容量 C_S ）的容性分量可通过加载小于等于0.5 V的交流电压来确定。

由于交流电容量取决于频率及温度，IEC 60384-1和IEC 60384-4规定，测量频率为100 Hz或120 Hz，测量温度为20 °C（如有特殊要求，可设定其它参考值）。

在其它应用中（如放电电路和定时元件），直流电容量起决定性作用。除这一情况外，用交流法测得的电容量也同样适合这些应用，不过需要做些修正以补偿两种测量结果差。

然而，在特殊情况下，可能必须测量直流电容量。IEC出版物未提供任何有关规范，因此，DIN标准确立了单独的标准，即DIN 41328-4，其中描述的测量方法包括对电容器进行一次性、不重复充电、放电。

3.2.2 额定电容量 C_R

额定电容量是用于设计电容器及标示在电容器上的交流电容量值。 C_R 可根据IEC 60384-1和IEC 60384-4有关标准中的具体测量方法测得。基准值源于E3或E6系列。

爱普科斯使用单位 μF 定义 C_R ，根据IEC 60384-4，在100 Hz或120 Hz，20 °C条件下测得电容量值。

3.2.3 Capacitance tolerance

The capacitance tolerance is the range within which the actual capacitance may deviate from the specific rated capacitance. Where the capacitance tolerances are to be indicated on the components themselves, EPCOS uses code letters to IEC 60062; this code letter is also part of the ordering code (refer to chapter "General technical information, 13 Marking of the capacitors").

3.2.4 Temperature dependence of the capacitance

The capacitance of an electrolytic capacitor is not a constant quantity that retains its value under all operating conditions. The temperature has a considerable effect on the capacitance. With decreasing temperature, the viscosity of the electrolyte increases, thus reducing its conductivity. The resulting typical behavior is shown in figure 7.

3.2.3 电容量允差

电容量允差是实际电容量偏离具体额定电容量的范围。爱普科斯使用IEC 60062中规定的代码字母在电子元件上标示电容量允差；相关字母也是订购代码的组成部分（参照“技术信息概要，13 电容器标志”）。

3.2.4 电容量温度特性

铝电解电容器的电容量不会在所有工作条件下保持常量。温度对电容量有很大影响。当温度下降时，电解液粘性会增加，因而会降低导电性。有关典型特性，请参见图7。

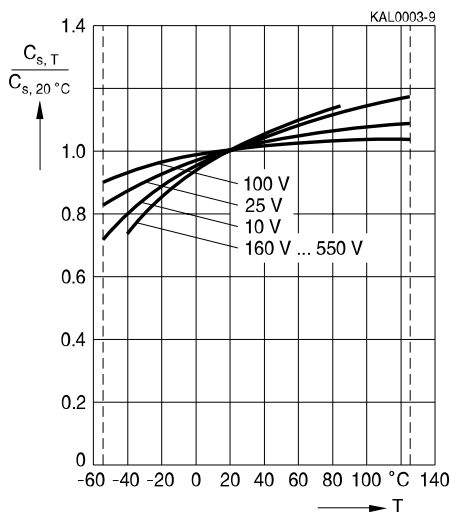


Figure 7
Temperature dependence of series capacitance C_s (typical behavior) Reference value: AC capacitance at 20 °C and 100 Hz

图7
串联电容量 C_s 的温度特性（典型特性）
参考值：温度20 °C和频率100 Hz条件下的交流电容量

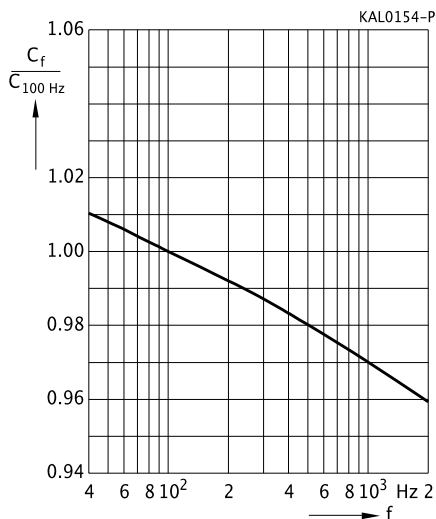
As a general rule, the characteristic curves are steeper for lower rated voltages and increasing anode surface roughness (deeper etching).

The most favorable flat shape of the curves shown in figure 7 is obtained by using special electrolytes which ensure that the capacitors can be operated at temperatures far below zero.

The shape of the curves varies widely, depending on whether the temperature relationship of the AC or of the DC capacitance is determined. The DC capacitance has a flatter temperature characteristic.

3.2.5 Frequency dependence of the capacitance

The AC capacitance depends not only on the temperature but also on the measuring frequency. Figure 8 shows the typical behavior. Typical values of the effective capacitance can be derived from the impedance curve, as long as the impedance is still in the range where the capacitive component is dominant.



通常，电容量特性曲线在额定电压较低时比较陡峭，阳极表面粗糙度越大（较深腐蚀）也会越陡峭。

图7中所示最平坦的曲线是使用特殊电解液的结果，这种电解液可保证电容器在远低于零度的温度下正常工作。

曲线形状可能有很大差别，这取决于交流电容量还是直流电容量的温度关系起作用。直流电容量的温度特性曲线更为平坦。

3.2.5 电容量频率特性

交流电容量不仅取决于温度，还取决于测试频率。图8所示为典型特性。有效电容量典型值可通过阻抗曲线得到，条件是阻抗仍在容性元件主导范围内。

$$C = \frac{1}{2 \cdot \pi \cdot f \cdot Z}$$

C	Capacitance	电容量	F
f	Frequency	频率	Hz
Z	Impedance	阻抗	Ω

Figure 8
Capacitance C versus frequency f
Typical behavior
图8
电容量C—频率f
典型特性

3.2.6 Charge-discharge proof

Frequent charging/discharging cycles may lead to a decrease in capacitance. Due to their special design A electrolytic capacitors produced by EPCOS are charge-discharge proof. This means that 10^6 switching cycles will cause a capacitance reduction of less than 10% (Charge-discharge test to IEC 60384-4).

3.3 Dissipation factor $\tan \delta$

The dissipation factor $\tan \delta$ is the ratio of the equivalent series resistance to the capacitive reactance component in the equivalent series circuit, or the ratio of effective power (dissipated power) to reactive power for sinusoidal voltages.

It is measured using the same setup as for the series capacitance C_S (see figure 6). IEC 60384-4 specifies the following maximum values:

Rated voltage 额定电压	$4\text{ V} < V_R \leq 10\text{ V}$	$10\text{ V} < V_R \leq 25\text{ V}$	$25\text{ V} < V_R \leq 63\text{ V}$	$63\text{ V} < V_R$
Maximum value for the 100-Hz dissipation factor (to IEC 60384-4) 100-Hz 损耗角正切最大值 (依据IEC 60384-4)	0.5	0.35	0.25	0.20

These values apply to capacitors with a maximum charge of 100000 μC . Proportionally higher dissipation factors are permissible for capacitors with higher maximum charges.

3.3.1 Frequency and temperature dependence of the dissipation factor

The dissipation factor, like the capacitance, varies with frequency and temperature. Figure 9, figure 10 and figure 11 show some examples of commonly used low-voltage and high-voltage electrolytic capacitors.

3.2.6 耐充放电

频繁的充电/放电循环会导致电容量降低。经过精心设计，爱普科斯铝电解电容器可耐充放电。这意味着 10^6 的充放电循环仅会导致10%以内的电容量损失（充放电测试依照IEC 60384-4标准进行）。

3.3 损耗角正切 $\tan \delta$

损耗角正切 $\tan \delta$ 是等效串联电阻与等效串联电路中容性电抗分量的比值，或者是正弦电压下有功率（耗散功率）与无功功率的比值。

其测量装置与测量串联电容量 C_S 相同（参见图6）。IEC 60384-4规定了以下最大值：

上述值适用于最大电荷达100000 μC 的电容器。相应地，具有更高最大电荷量的电容量容许更大的损耗角正切。

3.3.1 损耗角正切的频率和温度特性

与电容量相同，损耗角正切会受频率和温度的影响。图9、图10和图11为常用低压和高压电容器的示例。

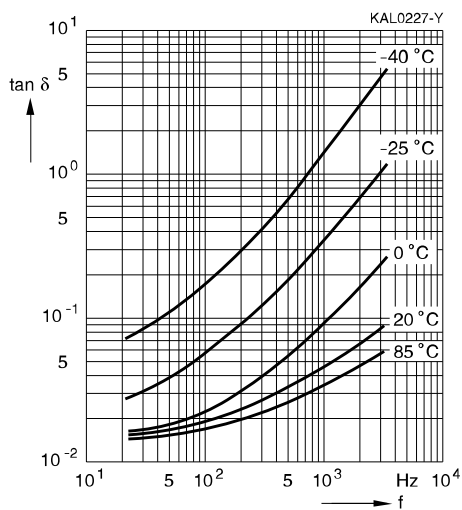


Figure 9
Low-voltage Al electrolytic capacitor
(Example: 100 μ F/63 V DC)

图9
低压铝电解电容器
(示例: 100 μ F/63 V DC)

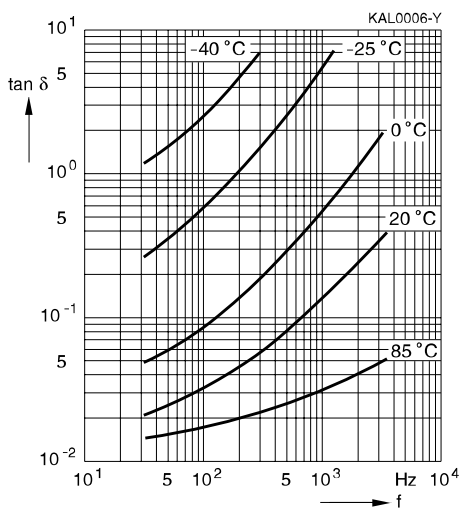


Figure 10
High-voltage Al electrolytic capacitor
(Example: 47 μ F/350 V DC)

图10
高压铝电解电容器
(示例: 47 μ F/350 V DC)

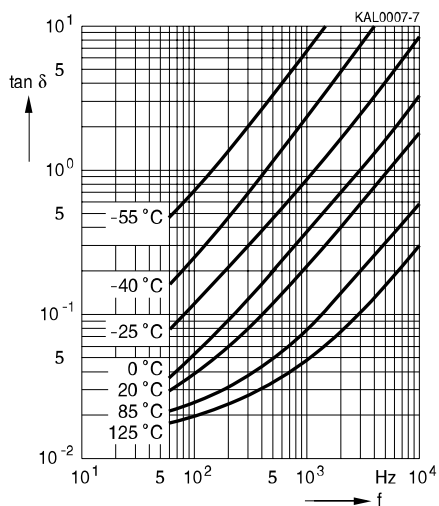


Figure 11
Low-voltage electrolytic capacitor "SIKOREL 125"
(Example: 220 μ F/40 V DC)

图11
低压电解电容器 "SIKOREL 125"
(示例: 220 μ F/40 V DC)

3.4 Self-inductance ESL

The selfinductance or equivalent series inductance results from the terminal configuration and the internal design of the capacitor. It is defined by the equivalent series circuit shown in figure 6.

3.5 Equivalent series resistance ESR

The equivalent series resistance is the resistive component of the equivalent series circuit. The ESR value depends on frequency and temperature and is related to the dissipation factor by the following equation:

$$ESR = \frac{\tan \delta}{\omega \cdot C_s}$$

ESR Equivalent series resistance

$\tan \delta$ Dissipation factor

C_s Series capacitance F

The tolerance limits of the rated capacitance must be taken into account when calculating this value.

3.6 Impedance Z

The impedance of an electrolytic capacitor results primarily from the series circuit formed by the following individual equivalent series components (figure 12):

3.4 自感ESL

自感或等效串联电感源于引出端结构和电容器内部设计，由图6所示等效串联电路确定。

3.5 等效串联电阻ESR

等效串联电阻指等效串联电路的电阻分量。ESR值取决于频率和温度，并与损耗角正切有关，相关公式如下：

$$ESR = \frac{\tan \delta}{\omega \cdot C_s}$$

ESR 等效串联电阻

$\tan \delta$ 损耗角正切

C_s 串联电容量

在计算ESR值时，必须考虑额定电容量的允许偏差限值。

3.6 阻抗Z

电解电容器的阻抗主要源于以下单个等效串联元件组成的串联电路（图12）：

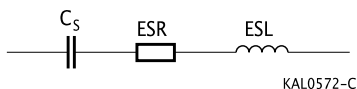


Figure 12

Simplified equivalent circuit diagram of an electrolytic capacitor

图12

铝电解电容器的简化等效电路图

- 1) Capacitive reactance $1/\omega C_S$ of the capacitance C_S
- 2) Dielectric losses and ohmic resistance of the electrolyte and the terminals (ESR)
- 3) Inductive reactance ωESL of the capacitor winding and the terminals.

The inductive reactance ωESL only depends on the frequency, whereas $1/\omega C_S$ and ESR depend on frequency and on temperature.

The characteristics of the individual resistive and reactive components determine the total impedance of the capacitor. Figures 13 and 14 show typical frequency and temperature characteristics of Al electrolytic capacitors.

- Capacitive reactance predominates at low frequencies.
- With increasing frequency, the capacitive reactance ($XC = 1/\omega C_S$) decreases until it reaches the order of magnitude of the electrolyte resistance.
- At even higher frequencies and unchanged temperatures (see 20 °C curve), the resistance of the electrolyte predominates.
- When the capacitor's resonance frequency is reached, capacitive and inductive reactance mutually cancel each other.
- Above this frequency, the inductive resistance of the winding and its terminals ($XL = \omega L$) becomes effective and leads to an increase in impedance.

The resistance of the electrolyte increases strongly with decreasing temperature. Figures 13 and 14 show that this component already has an effect at low frequencies for low temperature ranges.

Specific impedance values are given in the individual data sheets.

- 1) 电容量 C_S 的容性电抗 $1/\omega C_S$
- 2) 电解液和引出端的介电损耗和欧姆阻抗ESR
- 3) 电容器芯子和引出端的感性电抗 ωESL

电感 ωESL 仅取决于频率，而 $1/\omega C_S$ 和ESR则取决于频率及温度。

单独的阻性分量和无功分量的特性决定了电容器的总阻抗。图13和图14为铝电解电容器的典型频率和温度特性。

- 低频时容抗起支配作用。
- 频率升高时，容抗($XC = 1/\omega C_S$)逐渐减小，直至达到电解液阻抗相等的数量级。
- 当频率更高且温度不变时，电解液的阻抗起主要作用。
- 当达到电容器共振频率时，容抗和感抗相互抵消。
- 到达这一频率以上时，芯子和引出端($XL = \omega L$)的感抗开始起作用，导致阻抗增加。

电解液的阻抗随温度的降低会大幅度增加。图13和图14表明元件在低温范围内已呈现低频效应。

具体阻抗值参见单独的规格书。

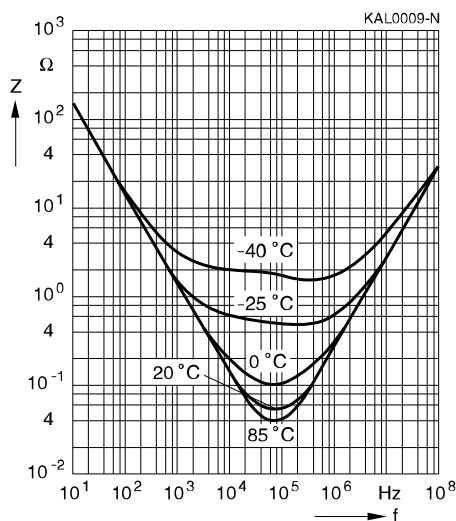


Figure 13
Impedance versus frequency and temperature
Example: 100 μ F/63 V DC (simplified graph)

图13

阻抗与频率及温度曲线

示例: 100 μ F/63 V DC (简图)

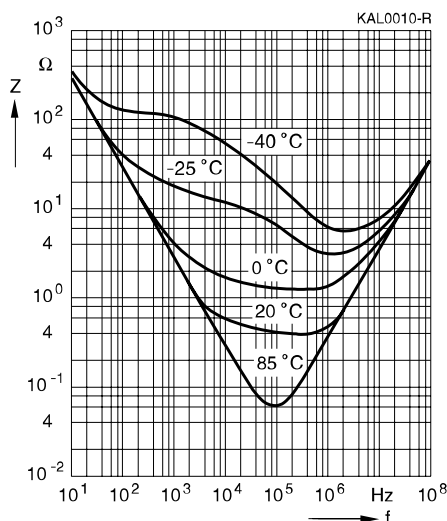


Figure 14
Impedance versus frequency and temperature
Example: 47 μ F/350 V DC (simplified graph)

图14

阻抗与频率及温度曲线

示例: 47 μ F/350 V DC (简图)

3.7 Leakage current I_{leak}

Due to the special properties of the aluminum oxide layer that serves as a dielectric, a small current will continue to flow even after a DC voltage has been applied for longer periods. This current is called the leakage current. A low leakage current is an indication that the dielectric is well designed.

3.7.1 Time and temperature dependence of the leakage current

As figure 15 shows, a high leakage current flows (inrush current) in the first minutes after applying a voltage to the capacitor, in particular after prolonged storage without any applied voltage. In the course of continuous operation, the leakage current will decrease and reach an almost constant "steady-state" value.

3.7 漏电流 I_{leak}

由于铝氧化层（同时充当绝缘层）的特殊属性，即使在直流电压施加很长时间后，还会有小股电流继续流过，这股电流即漏电流。漏电流越小，意味着绝缘层的性能越好。

3.7.1 漏电流的时间和温度特性

如图15所示，在电压加载至电容器的前几分钟内，有一股很强的漏电流流过，特别是在长时间储存期间未施加过电压的情况下。在连续工作期间，漏电流会减小，直至几乎恒定的“稳态”值。

The temperature dependence of the leakage current is shown in figure 16, taking a capacitor of the 85 °C temperature category as an example.

漏电流的温度特性如图16所示，以85 °C温度类别的电容器为例。

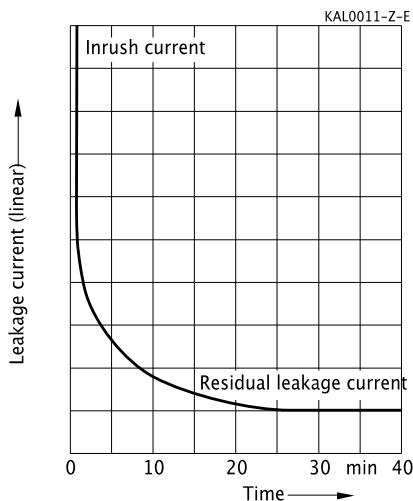


Figure 15
Leakage current versus time for which a voltage is applied

图15
施加电压时漏电流与时间的关系

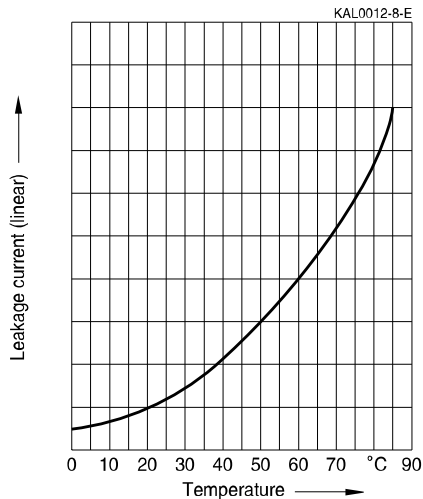


Figure 16
Leakage current versus temperature

图16
漏电流与温度的关系

3.7.2 Voltage dependence of the leakage current

The relationship between the leakage current and the voltage applied under constant temperature conditions is shown schematically in figure 17.

3.7.2 漏电流电压特性

在恒温下，漏电流和施加电压的关系如图17所示。

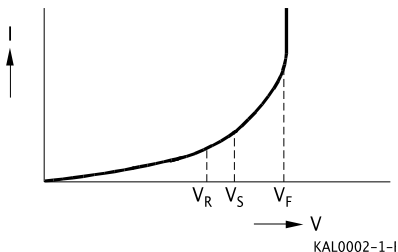


Figure 17
Voltage dependence of the leakage current

图17
漏电流的电压特性

3.7.3 Operating leakage current $I_{\text{leak,op}}$

The operational leakage current is the steady-state current that is attained during continuous operation. The $I_{\text{leak,op}}$ of Al electrolytic capacitors made by EPCOS can be calculated using the following equation:

LL grade:

$$I_{\text{leak,op}} = \frac{0.0005 \mu\text{A}}{\mu\text{F} \cdot \text{V}} \cdot C_R \cdot V_R + 1 \mu\text{A}$$

GP grade:

$$I_{\text{leak,op}} = \frac{0.001 \mu\text{A}}{\mu\text{F} \cdot \text{V}} \cdot C_R \cdot V_R + 3 \mu\text{A}$$

$I_{\text{leak,op}}$ Operating leakage current

C_R Rated capacitance

V_R Rated voltage

The results refer to the rated voltage V_R and a temperature of 20 °C.

In accordance with DIN 41240 and DIN 41332, the results obtained for 20 °C must be multiplied by the following factors, to allow for the temperature dependence of the operating leakage current of both General-purpose and Long-life grade capacitors:

Temperature (°C) 温度	0	20	50	60	70	85	125
Factor (typical value) 因数 (典型值)	0.5	1	4	5	6	10	12.5

When the actual operating voltage is below the rated voltage, the operating leakage current is substantially lower:

3.7.3 工作漏电流 $I_{\text{leak,op}}$

工作漏电流指连续工作状态下的稳态电流。可采用以下公式计算爱普科斯铝电解电容器的 $I_{\text{leak,op}}$:

LL级:

$$I_{\text{leak,op}} = \frac{0.0005 \mu\text{A}}{\mu\text{F} \cdot \text{V}} \cdot C_R \cdot V_R + 1 \mu\text{A}$$

GP级:

$$I_{\text{leak,op}} = \frac{0.001 \mu\text{A}}{\mu\text{F} \cdot \text{V}} \cdot C_R \cdot V_R + 3 \mu\text{A}$$

$I_{\text{leak,op}}$ 工作漏电流

C_R 额定容量

V_R 额定电压

上述结果是在额定电压 V_R 和 20 °C 条件下取得的。

根据 DIN 41240 和 DIN 41332, 20 °C 温度条件下取得的结果必须乘以以下因数, 以取得通用和长寿命级电容器工作漏电流的温度特性。

当实际工作电压低于额定电压时, 工作漏电流将大幅度减小:

General technical information 技术信息概要

Operating voltage, in % of the rated voltage V_R 工作电压, 额定电压 V_R 的百分之	20	30	40	50	60	70	80	90	100
Typical values, in % of the operating leakage current $I_{leak,op}$ (General-purpose grade) 典型值, 工作漏电流 $I_{leak,op}$ 的百分之(通用级)	3	6	9	14	18	25	40	50	100
Typical values, in % of the operating leakage current $I_{leak,op}$ (Long-life grade) 典型值, 工作漏电流 $I_{leak,op}$ 的百分之(长寿命级)	8	14	17	23	30	40	50	70	100

3.7.4 Leakage current for acceptance test I_{leak}

As the leakage current varies with time and temperature, it is necessary to define reference values for measuring time and temperature. To EN 130300 the leakage current is to be measured at 20 °C, after the rated voltage has been applied for 5 minutes. The following equation apply:

$$I_{leak} \leq 0.3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.7} + 4 \mu A \quad (\text{example for screw terminal products}) \quad (\text{示例: 螺钉式产品})$$

Acceptance testing for leakage current can be carried out at any temperature between 15 °C and 35 °C. The permissible limit values are then multiplied by the following conversion factors, with reference to the 20 °C value:

Temperature (°C) 温度	15	20	25	30	35
Factor (guideline value) 因数 (指导值)	0.8	1	1.5	2	2.5

Referee tests are to be carried out at 20 °C.

3.7.4 漏电流 I_{leak} 的验收试验

由于漏电流随时间和温度的不同而变化, 因此测量时间和测量温度参考值的定义就十分必要。根据 EN 130300, 在施加额定电压5分钟后, 待测漏电流应在20 °C时测量。下列公式适用:

在15 °C~35 °C之间, 均可实施漏电流的验收试验。然后, 容许限值应乘以以下转换因数, 参考20 °C时的值:

判定试验应在20 °C条件下实施。

3.7.5 Reforming

To IEC 60384-4, Al electrolytic capacitors are to be subjected to a reforming process before acceptance testing. The purpose of this preconditioning is to ensure that the same initial conditions are maintained when comparing and assessing different products.

For this purpose, the rated voltage is applied to the capacitors via a series resistance of approximately 100 for $V_R \leq 100$ V DC, or 1000 for $V_R > 100$ V DC, for a period of one hour.

Subsequently, the capacitors are stored under no-voltage conditions for 12 to 48 hours at a temperature between 15 and 35 °C. The leakage current must then be measured, at the latest after 48 hours.

If the capacitors meet the leakage current requirements without preconditioning, this procedure can be omitted.

3.7.6 Leakage current behavior with no voltage applied (voltage-free storage)

The oxide layer may deteriorate when Al electrolytic capacitors are stored without an externally applied voltage, especially at higher temperatures. Since there is no leakage current to transport oxygen ions to the anode in this case, the oxide layer is not regenerated. The result is that a higher than normal leakage current will flow when a voltage is applied after prolonged storage. As the oxide layer is regenerated in use, however, the leakage current will gradually decrease to its normal level.

Al electrolytic capacitors can be stored voltage-free for at least 2 years (1 year for ≤ 100 V_R single-ended products). Provided that these storage periods have not been exceeded, the capacitors can be operated at rated voltage directly after being taken out of storage. In this case, reforming as described under chapter "General technical information, 3.7.5

3.7.5 再化成

根据IEC 60384-4, 在验收试验前, 铝电解电容器必须进行再化成, 这一预处理步骤旨在保证在比较和评估不同产品时, 有一个相同的初始条件。

为此, 将通过约100 Ω ($V_R \leq 100$ V DC) 或约1000 Ω ($V_R > 100$ V DC) 的串联电阻将额定电压加载至电容器, 时长1小时。

随后, 将电容器在15 ~ 35 °C的无电压条件下存放12~48小时。然后, 必须最迟在48小时内测量漏电流。

如果电容器未经预处理便符合漏电流要求, 此步骤可忽略。

3.7.6 未施加电压时的漏电流特性 (无电压存储)

当铝电解电容器在不施加外部电压的情况下保存时, 氧化层可能会退化, 尤其是在高温下。因为此时没有漏电流传输阳离子给阳极, 所以氧化层无法再生。这导致长期存储后首次施加电压时, 会产生比正常漏电流更强的电流。然而, 由于在使用过程中氧化层会再生, 漏电流将逐渐降低至正常水平。

铝电解电容可以在不施加电压的情况下存储至少两年 (≤ 100 V_R 单向引线式产品为1年)。假设不超过这一存储期限, 那么存储后的电容器可以直接在额定电压下工作。在这种情况下, “技术信息概要, 3.7.5 再化成” 章节所述步骤可省略。

Reforming" is not required.

When designing application circuits, attention must be paid to the fact that the leakage current may be up to 100 times higher than normal during the first minutes following the application of power.

When the capacitors have been stored for more than two years, it is decisive whether the circuit will tolerate high initial leakage currents. A circuit that has been stored for more than two years with the capacitors incorporated, should be operated trouble-free for one hour. This will usually regenerate the capacitors so far that storage can be continued.

3.8 Breakdown strength and insulation resistance of insulating sleeves

Most Al electrolytic capacitors made by EPCOS are enveloped by an insulating sleeve. The minimum breakdown strength of the sleeve is 2500 V AC or 3500 V DC. A test method for verifying the breakdown strength of the sleeves is described in IEC 60384-4.

In order to ensure full breakdown strength, care must be taken not to damage the insulating sleeve, especially when ring clips are used for mounting.

The insulation resistance of the sleeve is at least 100 M. IEC 60384-4 specifies corresponding test methods.

As a standard feature, capacitors with an upper category temperature of +85 °C and +105 °C are fitted with external PVC insulation. They can also be supplied with polyester encapsulation. Capacitors with an upper category temperature of +125 °C have polyester encapsulation to standard.

在设计应用电路时必须注意，在刚加载电源的前几分钟内，漏电流可能高于正常水平数百倍。

当电容器保存2年后，电路是否允许较高初始漏电流往往具有决定性。随电容器一起存储两年以上的电路应进行无故障运行一小时。这通常可使电容器再生，然后可继续存储。

3.8 绝缘套管的击穿强度与绝缘电阻

爱普科斯的多数铝电解电容器使用绝缘套管封套。套管的最小击穿强度为2500 V AC或3500 V DC。有关验证套管击穿强度的试验方法，可参见IEC 60384-4。

为确保击穿强度，必须小心不要破坏绝缘套管，尤其是使用金属夹进行安装时。

套管的绝缘阻抗至少为100 MΩ。IEC 60384-4规定了相应的测试方法。

作为一项标准功能，上限类别温度为+85 °C 和 +105 °C的电容器配有外部PVC绝缘套管，也可使用PET绝缘套管。上限类别温度+125 °C的电容器采用标准PET绝缘套管。

4 Ripple current considerations

4.1 General

The term ripple current is used for the rms value of the alternating current that flows through the device as a result of any pulsating or ripple voltage. The maximum permissible ripple current value depends on the ambient temperature, the surface area of the capacitor (i.e. heat dissipation area), the dissipation factor $\tan \delta$ (or ESR) and on the AC frequency.

As thermal stress has a decisive effect on the capacitor's life expectancy, the dissipation heat generated by the ripple current is an important factor affecting the useful life.

These thermal considerations imply that, under certain circumstances, it may be necessary to select a capacitor with a higher voltage or capacitance rating than would normally be required by the respective application.

4.2 Frequency dependence of the ripple current

The dissipation factor (which is related to the equivalent series resistance) of Al electrolytic capacitors varies with the frequency of the applied voltage. As a result, the ripple current is also a function of the frequency. In the individual data sheets, the ripple current capability of the capacitors is generally referred to a frequency of 100 or 120 Hz, or in some cases to 10 or 20 kHz. Conversion factors for other operating frequencies are given for each type in the form of a graph.

4.3 Temperature dependence of the ripple current

The data sheets specify the maximum permissible ripple current for the upper category temperature for each capacitor type. For most of the types with category temperature above 85 °C, the ripple current ratings for 85 °C have also been included for the purpose of comparison.

The data sheets for each capacitor type also include a diagram showing the limit values for continuous operation at other ambient temperatures and ripple currents. This diagram also permits the expected useful life to be estimated for given operating conditions.

4 纹波电流因素

4.1 概述

当交流电受到脉动电压或纹波电压的影响流经设备时，使用rms值表示纹波电流。最大允许纹波电流取决于环境温度、电容器表面积（例如散热区域）、损耗角正切 $\tan \delta$ （或者 ESR）以及交流频率。

由于热应力对电容器寿命有决定性作用，由纹波电流产生的热量就是影响使用寿命的重要因数。

这些热量因素意味着在特定环境下，必须选用比常规条件耐压更优及电容更高的电容器来应对不同应用。

4.2 纹波电流的频率特性

铝电解电容的损耗角正切（与ESR有关）随施加电压的频率不同而不同。因此，纹波电流也依赖于频率。在单独的规格书中，电容器的纹波电流能力通常是在100 Hz或者120 Hz条件下，或者在某些个例中为10 kHz或者20 kHz。其它工作频率下的转换因数以图表的形式给出。

4.3 纹波电流的温度特性

针对每种电容器型号的上限类别温度，相应规格书明确了最大允许纹波电流。针对多数类别温度超过85 °C的型号，规格书还给出了85 °C时的纹波电流以做比较。

在每种电容器的规格书中，还列出了其它环境温度及纹波电流条件下持续工作的限值图表。该图表也可以用以估算给定工作条件下的预期使用寿命。

5 Climatic conditions

Limits must be set for the climatic conditions to which electrolytic capacitors are subjected (in part for reasons of reliability and in part due to the variation of the electrical parameters with temperature). It is therefore important to observe the permissible minimum and maximum temperatures and the humidity conditions stated in coded form as IEC climatic category (refer to chapter "General technical information, 7.4 IEC climatic category"). The IEC categories are given for each type in the corresponding data sheet.

5.1 Minimum permissible operating temperature (lower category temperature)

The conductivity of the electrolyte diminishes with decreasing temperature, causing an increase in electrolyte resistance. This, in turn, leads to increasing impedances and dissipation factors (or equivalent series resistances). For most applications, these increases are only permissible up to a certain maximum value. Therefore, minimum permissible operating temperatures are specified for Al electrolytic capacitors. These temperature limits are designated "lower category temperature" and are also part of the IEC climatic category.

It should be emphasized that operation below this temperature limit will not damage the capacitor. Especially when a ripple current flows through the device, the heat dissipated by the increased equivalent series resistance will raise the capacitor temperature so far above the ambient temperature that the capacitance will be adequate to maintain equipment operation.

The typical response of impedance and capacitance of a capacitor with a lower category temperature of -25 °C is illustrated in figures 28 and 29.

5 气候条件

当使用铝电解电容器时，必须对气候条件进行限制（部分出于可靠性考虑，部分出于电气参数温度特性的考虑）。因此，对IEC气候类别所述最低/最高温度和湿度条件的遵循就十分重要（参考“技术信息概要，7.4 IEC气候类别”）。有关每种型号的IEC类别，请参见相应规格书。

5.1 最低容许工作温度（下限类别温度）

电解液的导电性随着温度的降低而降低，从而会导致电解液阻抗的增加，并因此增加阻抗和损耗角正切（或ESR）。在绝大多数应用中，相应增加仅允许到某最大值。因此，对铝电解电容器的最低容许工作温度进行了明确。相应温度限值定义为“下限类别温度”，也是IEC气候类别的一部分。

需要强调的是，低于上述温度限值的工作并不会损坏电容，尤其是当纹波电流流经器件时，由于增加ESR而产生的热量耗散会提高电容器温度，使其远大于环境温度，使电容可维持设备运行。

图28和图29所示为下限类别温度为-25 °C电容器的阻抗和电容典型值。

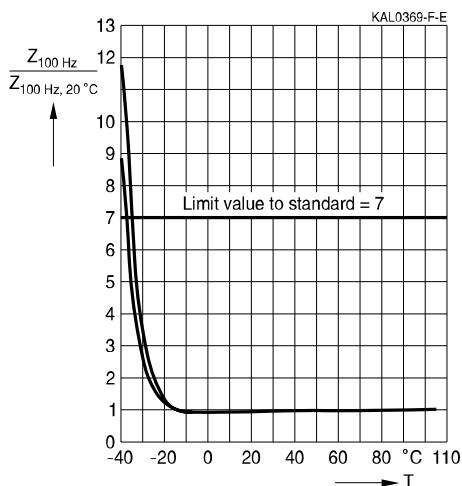


Figure 28
图28

5.2 Maximum permissible operating temperature (upper category temperature)

The upper category temperature is the maximum permissible ambient temperature at which a capacitor may be continuously operated. It depends on the capacitor design and is stated in the respective IEC climatic category. If this limit is exceeded the capacitor may fail prematurely.

For some type series, however, operation at temperatures above the upper category temperature is permissible for short periods of time. Details are given in the individual data sheets.

Useful life and reliability depend to a large extent on the capacitor's temperature. Operation at the lowest possible temperature will increase both useful life and reliability and is therefore recommended. For the same reason, it is advisable to select the coolest possible position within the equipment as a location for Al electrolytic capacitors.

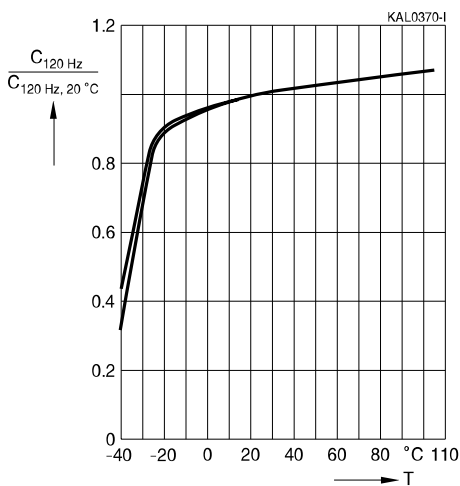


Figure 29
图29

5.2 最高容许工作温度（上限类别温度）

上限类别温度指电容器可连续工作的最高容许环境温度，这取决于电容器设计，在对应的IEC气候类别中有说明。如果超过该限值，电容器会过早失效。

对于一些系列的电容，短时间允许超过上限类别温度。详情参见单独的规格书。

使用寿命和可靠性很大程度上取决于电容温度。在最低可能温度下工作可提高寿命及可靠性，因此推荐使用。同样地，建议选择温度最低处安装铝电解电容器。

5.3 Storage conditions

Al electrolytic capacitors can be stored voltage-free at temperatures up to the upper category temperature. (Refer to chapter "General technical information, 3.7.6 Leakage current behavior with no voltage applied".)

This maximum storage temperature is the ambient temperature which the capacitor withstands in the non-operating condition without damage (refer to 2.2.11 of IEC 60384-1).

However, it must be taken into account that storage at elevated temperatures will reduce leakage current stability, useful life and reliability. In order not to impair these qualities unnecessarily, the storage temperature should not exceed +35 °C and should preferably be below +25 °C.

Storage at high temperatures and in an environment with high humidity should be avoided. For long periods of storage the capacitors should be stored at 5 to 35 °C with a relative humidity of $\leq 75\%$.

The standards for Al electrolytic capacitors specify a lower storage temperature that corresponds to the lower category temperature. Al electrolytic capacitors by EPCOS withstand the lowest specified storage temperature, i.e. -65 °C, without being damaged.

5.4 IEC climatic category

The permissible climatic stress on an Al electrolytic capacitor is given by the respective IEC climatic category. To IEC 60068-1, the climatic category comprises 3 groups of numbers, separated by slashes.

Example: 40 / 085 / 56

- 1st group: Lower category temperature (temperature limit) denoting the test temperature for test A (cold) to IEC 60068-2-1.
- 2nd group: Upper category temperature (temperature limit) denoting the test temperature for test B (dry heat) to IEC 60068-2-2.
- 3rd group: Number of days, the duration of test Cab (damp heat, steady state) at a relative humidity of 93 +2/-3% and an ambient temperature of 40 °C, to IEC 60068-2-78.

5.3 储存条件

在不加电压情况下，铝电解电容器可在上限类别温度条件下储存（参见“技术信息概要，3.7.6 未施加电压时的漏电流特性”）。

这里的最高储存温度是指电容在无负载条件下并不受到损坏时所能承受的最高环境温度。

然而，我们必须考虑到：在高温条件下的储存会减少漏电流稳定性，缩短使用寿命和降低可靠性。为了不削弱这些特性，存储温度不应超过+35 °C，建议低于+25 °C。

应避免把电容器储存在高温、高湿度的环境下。对于长期储存，合适的储存温度为5 °C到35 °C，同时相对湿度应不超过75%。

铝电解电容器相应标准规定了下限类别温度对应的较低储存温度。爱普科斯铝电解电容器可承受最低如-65 °C的储存温度而不受损。

5.4 IEC气候类别

铝电解电容器的容许气候类别见IEC气候类别手册说明。根据IEC 60068-1，气候类别由三组数据组成，由三条斜线分隔。

例如：40 / 085 / 56

- 第一组：下限类别温度（温度限值）指明测试用低温，IEC 60068-2-1，A（低温）
- 第二组：上限类别温度（温度限值）指明测试用高温，IEC 60068-2-2，B（干热）
- 第三组：天数，测试箱持续时间（湿热、稳态），相对湿度93 +2/-3%，环境温度40 °C，符合IEC 60068-2-78。

6 Flammability

6.1 Passive flammability

Under the influence of high external energy, such as fire or electricity, the flammable parts may get inflamed. Clause 4.38 of the relevant specification CECC 30 000 (Harmonized System of Quality Assessment for Electronic Components; Generic Specification: Fixed Capacitors) refers to IEC Publication 695-2-2 (Needle Flame Test) for testing the passive flammability of capacitors. And in CECC 30 000, severities and requirements for different categories of flammability are listed. Most of Al electrolytic capacitors meet the requirements of category C.

6.2 Active flammability

In rare cases the component may ignite caused by heavy overload or some capacitor defect. One reason could be the following: During the operation of an aluminum electrolytic capacitor with nonsolid electrolyte, there is a small quantity of hydrogen developed in the component. Under normal conditions, this gas permeates easily out of the capacitor. But under exceptional circumstances, higher gas amounts may develop and may catch fire if a sparking would occur at the same time.

As explained above a fire risk can't be totally excluded. Therefore, it is recommended to use special measures in critical applications (e.g. additional encapsulation of the equipment for mining applications).

7 Mechanical stress resistance

7.1 Vibration resistance

The vibration resistance values are specified in the individual data sheets.

6 可燃性

6.1 被动可燃性

在较高的外部能量如火灾或电击的影响下，易燃部件会燃烧。有关规范CECC 30 000（电子元件评估品质系统：一般规格：固定电容）的条款38，可参见IEC出版物695-2-2（针焰试验）来测试电容器的被动可燃性。此外，在CECC 30 000规范中，列出了不同种类可燃性的严重程度和要求。绝大多数铝电解电容器满足类别C的要求。

6.2 主动可燃性

在个别情况下，元件会由于严重过载或一些电容器缺陷而打火，这可能因为：在非固态铝电解电容器工作期间，内部产生了少量的氢。在正常条件下，这些气体很容易流出电容器，但在例外情况下，气体可能聚集，并在火花产生的同时着火。

如上所述，火灾风险无法完全排除，因此，建议在苛刻应用采用特殊措施（例如：在采矿应用设备中添加额外的封装）。

7 抗机械压力

7.1 耐振动性能

有关产品耐振动值，请参见单独的规格书。

7.2 Operating altitude

Al electrolytic capacitors can be used in high-altitude locations (to EN 130300 subclause 4.11.4).

7.3 Robustness of terminals

The mechanical strength of terminals and leads is defined in the respective detail specifications. Terminals of the capacitors in this book also meet the test conditions specified by IEC 60068-2-21. For tightening torques for screw terminals, refer to chapter "General technical information, 11.3 Mounting torques".

8 Maintenance

CENELEC R040-001 (chapter 1 to 19) provides general information on applications in which Al electrolytic capacitors are used. The most important subjects are: safety requirements and measures, installation in equipment with inherent heating, destruction by overpressure, fire hazards, parallel and series capacitor circuits.

Make periodic inspections for the capacitors that have been used in the devices for industrial applications. Before the inspection, make sure to turn off the power supply and carefully discharge the electricity of the capacitors. To check the capacitors, make sure of the polarity when measuring the capacitors by using a volt-ohm meter, for instance. Also, do not apply any mechanical stress to the capacitor terminals. The following items should be checked by the periodic inspections:

- Significant damage to appearances: venting, electrolyte leakage, etc.
- Electrical characteristics: leakage current, capacitance, $\tan \delta$ and other characteristics prescribed in the catalogs or product specifications.

If any of the above is found, replace it or take any other proper measure.

7.2 工作海拔

铝电解电容器可在高海拔位置运作（见EN 130300子条款 4.11.4）

7.3 端子坚固性

有关端子和引线的机械强度，可参见有关详细规格。本书所述电容器端子也符合IEC 60068-2-21规定的测试条件。关于端子的紧固力矩，请参考“技术信息概要，1.1.3 安装力矩”。

8 维护

CENELEC R040-001（章节1~19）提供了铝电解电容器应用的总体信息，其中最重要的主题是：安全要求和措施、有内部热量设备内的安装、过压损坏、火灾、并联和串联电容器电路。

对工业应用设备用电容器应进行周期性检查。在检查前，要确保关闭电源并仔细对电容放电。要检查电容器，在使用电压-欧姆表测量时要确保电容极性正确。另外，切勿在电容器端子上施加任何机械应力。周期性检查要包括以下项目：

- 严重的外观破损：是否弯曲、电解液是否泄漏等；
- 电气参数：漏电流、电容、 $\tan \delta$ 及产品系列或产品规格中规定的其它特性。

如果发现存在上述任何一种问题，要立即进行更换或采取适当措施。

9 Mounting

9.1 Mounting positions of capacitors with screw terminals

During operation Al electrolytic capacitors will always conduct a leakage current which causes electrolysis. On one hand, the oxygen produced by electrolysis will regenerate the dielectric layer but, on the other hand, the hydrogen released may cause increased internal pressure of the capacitor.

A safety vent in the can disk allows the gas to escape when the pressure reaches a certain level and prevents the capacitor from exploding in case of pressure increase due to an overload condition.

To prevent electrolyte from leaking out when the gas has vented, the capacitor should not be mounted with the terminals (safety vent) facing down. The recommended mounting positions to avoid a ventdown installation of the capacitor are shown in figure 30.

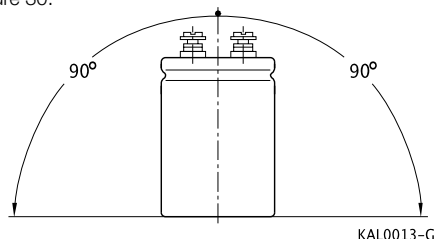


Figure 30

Example:

- Upright mounting is recommended, particularly when the capacitors are fixed by their terminals, or by a threaded stud near the base.
- In case of horizontal mounting, the safety vent should be at the "12 o'clock" position.

Mounting positions other than recommended will not cause any direct damage to the capacitor, but may result in serious damage in the application during operation due to electrolyte leakage in the case of venting.

9 安装

9.1 螺钉式电容器的安装位置

在工作期间，铝电解电容器会持续流过漏电流，导致电解。一方面，电解产生的氧会使绝缘层再生，但另一方面，释放的氢气会在电容器内部产生气压。

当气压达到一定水平时，盖板上的安全阀便会释放气体，从而防止电容器由于过载时气压过高而发生爆炸。

为防止气体释放时电解液泄漏，电容器的端子（安全阀端）不可倒置安装。为避免电容器安全阀倒装，推荐如图30所示的安装位置。

Figure 30
Recommended range of mounting positions

图30
推荐安装位置

例如:

- 推荐端子朝上安装，尤其是当通过端子或底部附近的螺栓固定电容器时。
- 在水平安装时，安全阀应在“12点”位置。

除上述推荐安装位置外的其它方式并不会直接损坏电容器，但可能会由于电解液在排气过程中发生泄漏而导致运行中一系列间接的破坏。

9.2 Potting and gluing of Al electrolytic capacitors

- Potting compound or glue must be free of halogens and other corrosive substances.
- The potting and gluing materials must not impair the function of the capacitor's safety vent.
- Potting compounds or glue may heat up capacitors while curing. If possible the upper category temperature should not be exceeded.
- Temperatures above 150 °C may damage the insulation.
- Depending on the duration a temperature rise during the curing process may lead to an increased leakage current of the capacitors when the application is switched on first time. The life span of the capacitors usually is not affected.
- Potting compounds usually have a low thermal conductivity, which may adversely affect the emission of heat from the capacitors during operation. Increased heating up may shorten the life span of the capacitors.
- When warmed up the potting compound may exert pressure on the capacitor. Such pressure shall not exceed 20 bars.
- The PVC of the heat shrink sleeve may contain substances that on a long-term basis can react aggressively with the potting compound or glue.
- If gluing is the only mechanical attachment, then the mechanical stability of the shrinking sleeves is the determining factor for the stability of the attachment of the capacitor.

9.2 铝电解电容器的封装和粘接

- 封装化合物或粘胶物必须不含卤素或其它腐蚀性物质。
- 封装或粘胶材料必须不损坏电容器安全阀的功能。
- 封装化合物或粘胶物可能在加工过程中加热电容器。如果可能，切勿超过上限类别温度。
- 超过150 °C可能会损坏绝缘层。
- 根据持续时间的长短，加工过程中的温升可能会导致电容器在首次通电时漏电流上升，但基本不会影响电容寿命。
- 封装化合物由于导热性不佳，通常会影响电容器工作时的散热效果。持续加热会缩短电容器寿命。
- 当加热时，封装化合物可能会给电容器施加压力，这一压力不应超过20 bars。
- 热缩管的PVC材料可能含有一些经过长期运作后会与封装化合物或粘胶物产生剧烈反应的物质。
- 如果粘接是唯一的机械固定方式，那么热缩套管的机械稳定性就是电容稳定系数的决定因素。

9.3 Mounting torques

The maximum torques listed below may not be exceeded when tightening screw terminals or mounting stud nuts.

Thread 螺栓	Maximum torque 最大扭矩 (Nm)
M5	2.5
M6	4.0
M8	4.0
M12	10.0

9.3 安装扭矩

在锁紧螺栓或安装螺母时，不可超过下表所列最大扭矩。

9.4 Soldering

- Excessive soldering time or temperature can negatively affect the capacitor's characteristics and Cause damage to the insulation sleeve. Therefore,
- Avoid contact of the soldering iron to the sleeve.
- Ensure that soldering conditions are within the limits prescribed in the product specification below.

Resistance of aluminium electrolytic capacitors to soldering heat is specified according to IEC 60384-4, which refers to IEC 60384-1 for further details. EPCOS aluminium electrolytic capacitors meet the requirements of IEC 60384-4 with the following restrictions:

According to 4.14 of IEC 60384-1(Not applicable to capacitors with screw terminations or other terminations not designed to be soldered, as stated in the detail specification

Test conditions: No pre-drying
IEC 60068-2-20, Test Tb, method 1(solder bath)
(260 ± 3) °C, (10 ± 1) s

Requirements: No visible damage, legible marking
 $\Delta C/C \leq 5\%$ of initial value

9.4 焊接

- 焊接时间过长或过温会对电容器性能产生负面影响并破坏绝缘套管。
- 避免用烙铁接触绝缘套管。
- 应确保焊接条件在下述产品规格书限定的范围内。

铝电解电容的耐焊接热依据IEC 60384-4规定，详细信息参考IEC 60384-1。爱普科斯铝电解电容器符合IEC 60384-4要求，限定条件如下：

依据IEC 60384-1的4.14条款（不适用于螺钉端子或其它未设计用于焊接端子的产品，详见详细规范）

测试条件： 未预干燥
按IEC 60068-2-20试验Tb的方法1（浸溶）
(260 ± 3)°C, (10 ± 1)秒

要求： 无可见损坏，标志清晰
 $\Delta C/C \leq 5\%$ 初始值

9.5 Cleaning agents

Halogenated hydrocarbons may cause serious damage if allowed to come into contact with Al electrolytic capacitors. These solvents may dissolve or decompose the insulating film and reduce the insulating properties to below the permissible level. The capacitor seals may be affected and swell, and the solvents may even penetrate them. This will lead to premature component failure.

Because of this, measures must be taken to prevent electrolytic capacitors from coming into contact with the solvents when using halogenated hydrocarbon solvents to clean printed circuit boards after soldering the components, or to remove flux residues. If it is not possible to prevent the electrolytic capacitors from being wetted by the solvent, halogen-free solvents must be used in order to eliminate the possibility of damage.

Halogen-free solvents:

Ethanol (methylated spirits)
Propanol
Isopropanol Isobutanol
Propyleneglycoether
Diethyleneglycoldibutylether

Critical solvents:

The following list contains a selection of critical halogenated hydrocarbons and other solvents frequently used, partially in pure form, partially in mixtures with other solvents, as cleaning agents in the electrical industry.

Trichlorotrifluoroethane (trade names e.g. Freon, Kaltron, Frigene)
Trichloroethylene
Trichloroethane (trade names e.g. Chlorothene, Wacker 3 x 1)
Tetrachloroethylene (trade name: Per)
Methylenechloride
Chloroform
Carbontetrachloride
Acetone
Methylethylketone
Ethylacetate
Butylacetate

9.5 清洁剂

如果卤代烃接触到铝电解电容器，会造成严重破坏。相关溶剂可溶解或分解绝缘皮并将绝缘性能降低至允许范围以下，电容器封口也会受到影响而膨胀，而相关溶剂甚至可以穿过封口，导致电容过早损坏。为此，在焊接元件至PCB板后，如需使用卤代烃清洗板面或去除焊剂残渣时，必须采取措施来预防电解液接触溶剂。如果不可能预防电容器接触溶剂，必须使用无卤溶剂以避免破坏。

无卤溶剂:

酒精（甲基化酒精）
丙烷基酒精
异丙醇
丁醇
丙烷基乙二醇
二乙基乙二醇

临界溶剂:

下表为电子产业常用的临界卤代烃和其它溶剂，有时单独使用，有时与其它溶剂混合使用。

三氟三氯乙烷（商品名称如氟利昂、Kaltron及Frigene）
三氯乙烯
三氯乙烷（商品名称如氯乙烷、Wacker 氯酞 3 x 1）
四氯乙烯（商品名称如PER）
亚甲基二氯
三氯甲烷
四氯甲烷
丙酮
丁酮
乙酸乙酯
醋酸丁酯

However, printed-circuit board cleaning equipment is available which uses halogenated solvents but is designed to enable thorough cleaning in a very short time (four-chamber ultrasonic cleaning process). Furthermore, the processes used ensure that virtually no solvent remains on the cleaned parts.

This means that the general warning against the use of halogenated cleaning solvents on Al electrolytic capacitors can be qualified if the following conditions are met:

1. The cleaning period in each chamber must not exceed 1 minute.
2. The final cleaning stage must use a solvent vapor only. The temperature must be 50 °C or lower.
3. Adequate drying must be ensured immediately after the cleaning process in order to evaporate any condensed residual solvent.
4. Contaminated cleaning agents must be regularly replaced as specified by the manufacturer and by legal regulations.

10 Fumigation

International shipments of products are subjected in many countries to a fumigation treatment using halogenated chemicals (e.g. methyl bromide) in order to control insect infestation, particularly when wooden packaging is used. The halogenated gas can penetrate cardboard boxes, polymer bags or other packaging materials and come into direct contact with equipment or components contained within and may cause corrosion of Al electrolytic capacitors. The halogenated gas can also penetrate the seals of Al electrolytic capacitors and may cause internal corrosion, possibly resulting in an open-circuit after the equipment has been put into operation.

然而，现有PCB板清洗设备常使用卤化溶剂，但经设计可在短时间内实现彻底清洁（四舱超声波清洗工艺）。此外，所用工艺可确保清洗元件上无溶剂残留物。

这表明，当满足下列条件时，即遵循了铝电解电容器使用卤化清洁剂的通用注意事项：

1. 每舱清洗时间不超过1分钟。
2. 最后清洗阶段必须使用单独一种溶剂蒸汽，温度必须小于或等于50 °C。
3. 在清洗工序后，一定要立即确保充分烘干，以蒸发掉任何冷凝的残留溶剂。
4. 必须按照制造商和法定条例规定定期更换受污染清洁剂。

10 熏蒸

在许多国家，国际运输产品需要使用卤化剂（例如甲基溴）进行熏蒸处理，以控制昆虫侵染，特别是使用木质包装时。卤化气体可穿透包装箱、聚合物袋及其它包装材料，直接接触设备或内部所含电子元件，从而会腐蚀铝电解电容器。卤化剂还会穿透铝电解电容器的封口，进而导致内部腐蚀，并可能导致设备在投入运行时发生开路。

11 Marking of the capacitors

The example below shows how the snap-in capacitors could be marked:



EPCOS LL
B43501-A2108-M
1000 μ F (M)
200 V— 40/085/56
08.06

Manufacturer (company logo)
Grade (only on LL grade capacitors)
Part number (ordering code)
Rated capacitance, tolerance (in coded form)
Rated voltage, climatic category
(to IEC or coded as explained below)
Month and year of production

制造商(公司标志)
等级(仅用于LL级电容器)
料号(订购代码)
额定电容、容差(代码形式)
额定电压、气候分类
(根据IEC或按照下述代码标记)
月·年(生产日期)

KAL1009-T-E

Figure 32
Marking example

11 电容器标签

以下示例说明焊片式电容器的标签内容:

图32
标签示例

Capacitance tolerances are coded to IEC 60062 using the codes shown below:

电 容 容 差 根 据 IEC 60062 标 准 使 用 下 列 代 码 表 示:

Code letter 代码字母	Capacitance tolerance 电 容 容 差		Code letter 代码字母	Capacitance tolerance 电 容 容 差
A	Tolerances to which no other code applies		R	-20%/+30%
K	$\pm 10\%$		S	-20%/+50%
M	$\pm 20\%$		T	-10%/+50%
N	$\pm 30\%$		V	-10%/+100%
Q	-10%/+30%		Y	0%/+50%
			Z	-20%/+80%

The climatic category is specified to IEC 60068-1 (refer to chapter "General technical information, 7.4 IEC climatic category"). If there is not enough space on the case, the following codes may be used:

气候类别符合IEC 60068-1（参考“技术信息概要, 7.4 IEC气候分类”）。如果壳体上没有足够空间, 可使用以下代码:

General technical information 技术信息概要

E.g.: 40/085/56, in coded form, would read GPF
1st letter (lower category temperature)

例如：40/085/56的代码形式为GPF
首字母（下限类别温度）

Code letter 代码字母	F	G	H
Temperature 温度 (°C)	-55	-40	-25

2nd letter (upper category temperature)

第二字母（上限类别温度）

Code letter 代码字母	K	M	P	S	U
Temperature 温度 (°C)	+125	+105 (+100)	+85	+70	+60

3rd letter (humidity)

第三字母（湿度）

Letter F: withstands test Cab (damp heat, steady state), test duration 56 days, to
IEC 60068-2-78.

字母F: 经受试验箱（湿热、恒稳态），试验周期56天，符合IEC 60068-2-78。

12 Packing

When packing our products, we naturally pay attention to environmental protection aspects. This means that only environmentally compatible materials are used for packing, and the amount of packing is kept to an absolute minimum. In observing these rules, we are also complying with German packing regulations.

In order to further comply with the aims of the regulations concerning the reduction of waste, we have implemented the following measures:

- The use of standardized "Euro"-pallets.
- Goods are secured on the pallets using straps and edge protectors made of environmentally compatible plastics (PE or PP).

12 包装

在包装产品时，爱普科斯非常注意环保。这意味着我们只采用环保材料进行包装，且保证使用最少的材料。

为进一步符合环保法规，爱普科斯采取了以下措施：

- 使用标准化欧盟托板。
- 使用环保塑料（PE或PP）绑带或护棱将货物紧固在托板上。

General technical information 技术信息概要

- The shipping cartons (transport packing) qualify for and carry the RESY logo.
- Separating layers between pallets and cartons are of a single material type, preferably paper or cardboard.
- Paper is used as filler and padding material.
- The shipping packaging are sealed with plastic tape to ensure technically efficient recycling.
- By agreement, we are prepared to take back the packing material (especially product-specific plastic packages). However, we ask our customers to send cardboard cartons, corrugated cardboard, paper etc. to recycling or disposal companies in order to avoid unnecessary transportation of empty packing materials.
- 运输纸箱（运输包装）满足RESY要求，带有RESY标识。
- 托板和纸箱之间采用单一材料分隔层，首选纸材或纸板。
- 填充和垫料采用纸材。
- 运输包装使用塑料扎带封装，以充分保证循环次数。
- 如经同意，爱普科斯随时准备回收包装材料（尤其是产品用塑料包装）。不过，我们需要客户将纸板、纸箱、瓦楞纸板、纸材等送至回收或者废品回收公司，以避免由于运输空包装材料而造成浪费。

12.1 Bar code label

The packing of all EPCOS components bears a bar code label stating the type, ordering code, quantity, date of manufacture and batch number. This enables a component to be traced back through the production process, together with its batch and test report.

12.1 条形码标签

爱普科斯所有电子元件的包装都使用条形码标签表明型号、订购代码、数量、制造日期及批号。这保证元件在生产过程及批号和测试报告中有据可循。



Figure 33
Example of bar code label

(1P)	Ordering code	订购代码
(9K)	Product order number	订单号
(D)	Date code (yywwdd)	日期代码（年月日）
(T)	Batch number	批号
(Q)	Quantity	条形码标签示例数量

KAL1121-I-E

图33
条形码标签示例

13 Structure of the ordering code (part number)

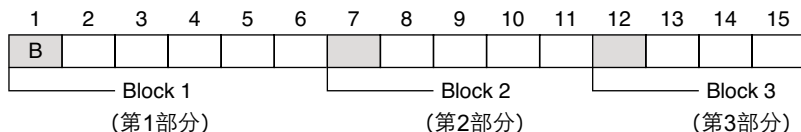
All technical products made by EPCOS are identified by a part number (which is identical to the ordering code). This number is the unique identifier for any respective specific component that can be supplied by us. The customer can speed up and facilitate processing of his order by quoting the part numbers. All components are supplied in accordance with the part numbers ordered.

A part number consist of up to 15 digits and comprises three blocks of data. Each of these blocks starts with a letter, all other positions are allocated to numerals.

13 订购代码结构 (料号)

爱普科斯所有技术产品均有专门的料号 (等同于订购代码)。该料号为爱普科斯供应的对应具体元件的唯一识别码。客户可通过料号来加快下单和处理速度。所有电子元件的供应均依据订单料号。

单一料号包含15位数, 由三部分数据组成。每部分以字母开头, 其它位置为数字。



Digit 数字	Meaning 含义
1	B = Passive components 无源元件
2	4 = Electrolytic capacitors 电解电容器
3	1 = Low-voltage range ≤ 100 V DC (低压范围) ≤ 100 V DC 3 = High-voltage range ≥ 150 V DC (高压范围) ≥ 150 V DC
4 to 6	Type 型号

General technical information 技术信息概要

7	Design variant 设计变量																				
8	Rated voltage 额定电压 Low-voltage range 低压范围(V DC) High-voltage range 高压范围 (V DC) <table><tr><td>1: 3</td><td>1: 150, 160</td></tr><tr><td>2: 6.3</td><td>2: 200*), 250</td></tr><tr><td>3: 10, 12</td><td>3: 300, 385*)</td></tr><tr><td>4: 15, 16</td><td>4: 350</td></tr><tr><td>5: 25</td><td>5: 450</td></tr><tr><td>6: 30, 50</td><td>6: 500</td></tr><tr><td>7: 35, 40</td><td>7: 510, 520, 550*)</td></tr><tr><td>8: 63, 70</td><td>8: 330, 600*)</td></tr><tr><td>9: 100</td><td>9: 360*), 400*)</td></tr><tr><td>0: special 特制</td><td>0: special 特制</td></tr></table> *) Designation with code number "0" possible for older types. 代号中有代码“0”的产品支持旧型号。	1: 3	1: 150, 160	2: 6.3	2: 200*), 250	3: 10, 12	3: 300, 385*)	4: 15, 16	4: 350	5: 25	5: 450	6: 30, 50	6: 500	7: 35, 40	7: 510, 520, 550*)	8: 63, 70	8: 330, 600*)	9: 100	9: 360*), 400*)	0: special 特制	0: special 特制
1: 3	1: 150, 160																				
2: 6.3	2: 200*), 250																				
3: 10, 12	3: 300, 385*)																				
4: 15, 16	4: 350																				
5: 25	5: 450																				
6: 30, 50	6: 500																				
7: 35, 40	7: 510, 520, 550*)																				
8: 63, 70	8: 330, 600*)																				
9: 100	9: 360*), 400*)																				
0: special 特制	0: special 特制																				
9 to 11	Capacitance 电容量 The capacitance is given in coded form. 电容量以编码形式提供 Examples: 例如 Data digit 数字 91011 B 4 3 5 0 1 A 9<table><tr><td>1</td><td>5</td><td>7</td></tr></table>= 15 · 10⁷ pF = 150 μF	1	5	7																	
1	5	7																			
12	Capacitance tolerance (code to IEC 60062) 电容量允许偏差（代码符合IEC 60062） A: Special tolerance 特殊允许偏差 <table><tr><td>S: 20/+50 %</td></tr><tr><td>T: 10/+50 %</td></tr><tr><td>V: 10/+100 %</td></tr><tr><td>Y: 0/+50 %</td></tr><tr><td>Z: 20/+80 %</td></tr></table> K: ± 10 % M: ± 20 % N: ± 30 % Q: 10/+30 % R: 20/+30 %	S: 20/+50 %	T: 10/+50 %	V: 10/+100 %	Y: 0/+50 %	Z: 20/+80 %															
S: 20/+50 %																					
T: 10/+50 %																					
V: 10/+100 %																					
Y: 0/+50 %																					
Z: 20/+80 %																					

General technical information 技术信息概要

13, 14, 15	Code numbers for special versions, terminal styles and packing Capacitors with screw terminals: Code number for heat sink mounting and low-inductance versions Snap-in and 4-pin snap-in capacitors: Code number for versions with short or 3 terminals, PET insulation sleeve or additional PET insulation cap 特殊产品、端子型号和包装代码 螺钉式电容器: 散热片安装和低电感版代码 焊片和4针焊片式电容器 短端子或3端子产品、PET绝缘套管或其它PET绝缘帽代码
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Corporate goals

Our aim is to play a leading role among the world's most competitive companies in the sector of electronic components. This aim is shared by the EPCOS quality and environment management system:

1 EPCOS quality system

1.1 Extract from the EPCOS quality policy

- The quality of our products and services represents a key constituent of our corporate strategy, whose principal aim is customer satisfaction.
- Our quality management system is continuously oriented to the international standards that stipulate the highest requirements.

1.2 Quality management system

The quality management system to ISO/TS 16949:2002 is applied throughout the company and is used to implement the EPCOS quality policy. The implications include:

- As a rule, product and process developments follow the rules of APQP¹⁾,
- Quality tools such as FMEA²⁾, DoE³⁾ and SPC⁴⁾ minimize risks and ensure continuous improvements in conjunction with regular internal audits and QM reviews.

公司目标

爱普科斯致力于成为世界电子元件行业中最具竞争力企业的佼佼者，这离不开爱普科斯的质量和环境管理体系。

1 爱普科斯质量体系

1.1 爱普科斯质量方针摘要

- 产品和服务质量是公司策略的重要组成部分，其中的主要目标是让客户满意。
- 爱普科斯质量管理体系持续跟进规定最高要求的国际标准。

1.2 质量管理体系

ISO/TS 16949:2002质量管理体系贯穿于整个公司，用于执行爱普科斯质量方针。其含义包括：

- 根据惯例，产品的开发和工艺的改进遵循产品质量先期策划（APQP¹⁾），
- 失效模式及后果分析（FMEA²⁾）、试验设计（DoE³⁾）以及统计过程控制（SPC⁴⁾）等质量工具在最小化风险的同时，还保证通过定期内部审核及质量管理评审进行持续改进。

1.3 Certification

The EPCOS quality management system forms the basis for the company certification to ISO 9001:2000 and ISO/TS 16949:2002 that comprises the EPCOS plants and sales organizations. The company certificates are posted on the EPCOS Internet (www.epcos.com/quality).

1.4 Production sequence and quality assurance

The divisions implement the corporate quality management guidelines in procedural and work instructions referred to products and processes.

The following example shows quality assurance applied to the production sequence of aluminum electrolytic capacitors.

1.3 认证

爱普科斯质量管理体系为公司及其工厂和销售机构通过ISO 9001:2000和ISO/TS 16949:2002认证奠定了基础。公司的各项证书在爱普科斯网站 (www.epcos.com/quality) 上均有发布。

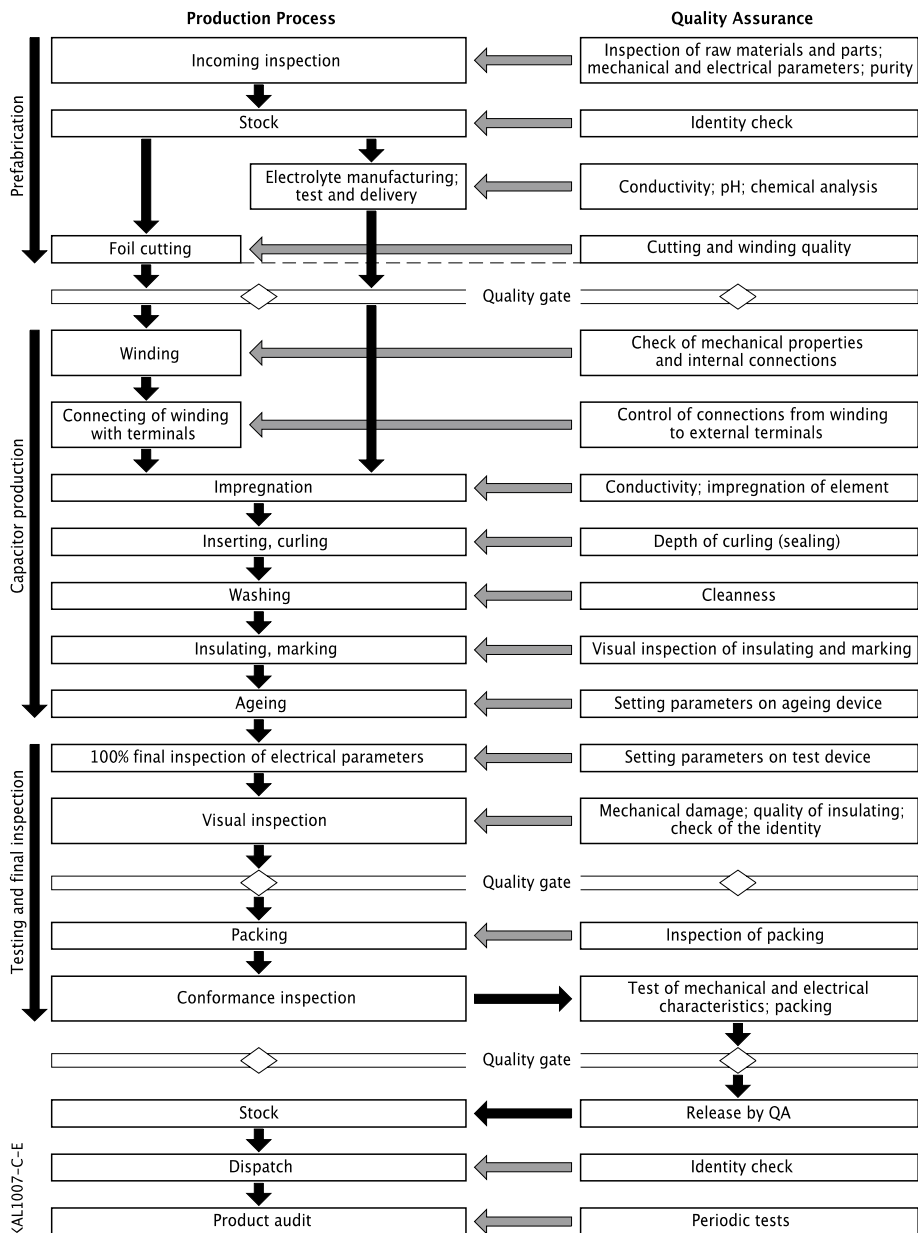
1.4 生产流程和品质控制

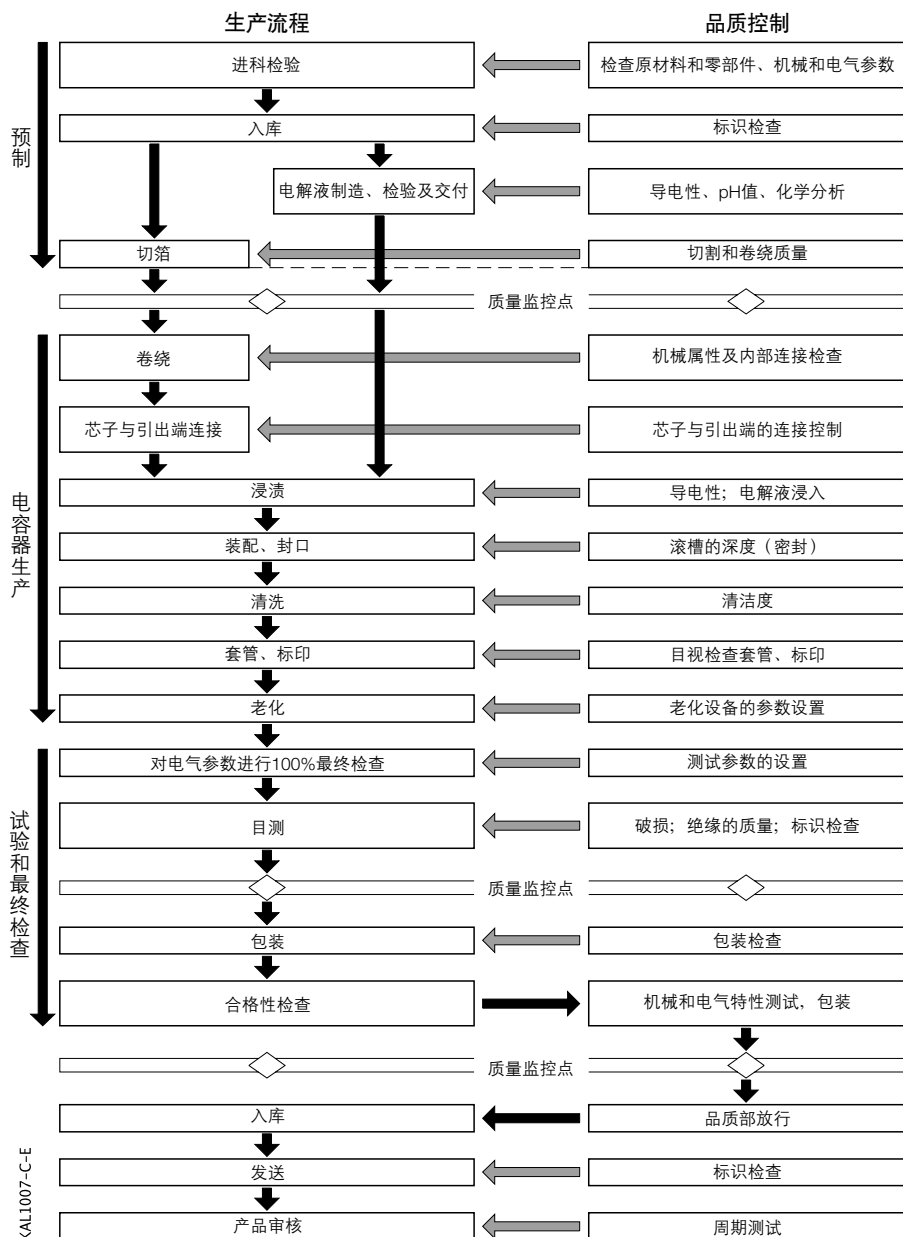
公司各部门在实施产品和生产过程有关程序和作业指导书时, 均要求贯彻公司质量管理方针。

下述内容为铝电解电容器在生产流程中运用品质控制的示例。

- 1) APQP= Advanced Product Quality Planning
- 2) FMEA= Failure Modes and Effects Analysis
- 3) DoE= Design of Experiments
- 4) SPC= Statistical Process Control

- 1) APQP= 产品质量先期策划
- 2) FMEA=失效模式及后果分析
- 3) DoE= 试验设计
- 4) SPC=统计过程控制





1.5 Delivery quality

“Delivery quality” means compliance with the agreed data at the time of delivery.

1.6 Failure criteria

A component is defective if one of its features does not correspond to the specification of the data sheet or an agreed delivery specification.

1.7 Incoming goods inspection at the customer

We recommend the use of a random sampling plan according to ISO 2859-1 (contents compliant with MIL STD 105 D and IEC 60410) for incoming goods inspection.

The test methods to be used are laid down in the relevant standards. Deviations must be agreed by the customer and the supplier.

1.8 Duration of use

The service life in terms of reliability is the time period during which random failures occur, i.e. the range in the product operating life in which the failure rate remains largely constant (early failures and end of operating life excepted). The value depends strongly on conditions of use.

1.8.1 Failure rate (long-term failure rate)

The failure rate is defined as the failure percentage divided by a specified operating period. The failure rate is expressed in fit (failures in 10^9 component hours) or as percentage of failures in 1000 hours.

1 fit = $1 \cdot 10^{-9}$ /h (fit = failure in time)

1.5 出厂品质

出厂品质指交货时产品质量的各项数据与协定数据是否保持一致的情况。

1.6 失效判据

如果某元件的其中一个特性与技术资料规范或协定的交货规格不相符，该元件即视为缺陷产品。

1.7 顾客处来料检验

对于来料检查，我们建议按照ISO 2859-1（内容与MIL STD 105 D 和 IEC 60410一致）采用随机抽样方法。

所用测试方法在相关标准中有叙述。存在的偏差必须经顾客和供应商协商同意。

1.8 持续使用时间

从可靠性方面讲，使用寿命指随机故障发生的时间段，即在产品使用寿命范围内，故障频繁发生范围（早期故障和使用寿命结束除外），其值在很大程度上取决于使用条件。

1.8.1 故障率（长期故障率）

故障率是某特定操作时间除以故障百分比的值。故障率用计次故障率（FIT）（ 10^9 元件小时的故障次数）或1000小时内故障百分比表示。

1 FIT = 1×10^{-9} /小时（FIT = 计次故障率）

Example of a failure rate λ test determined by a useful life test:

1. Number of components tested $N = 8000$
2. Operating hours $t_b = 25000 \text{ h}$
3. Number of failures $n = 2$

通过使用寿命测试确定的故障率 λ test 示例:

1. 测试元件的数量 $N = 8000$
2. 操作时间 $t_b = 25000 \text{ 小时}$
3. 故障次数 $n = 2$

$$\lambda_{\text{test}} = \frac{n}{N} \cdot \frac{1}{t_b} = \frac{2}{8000} \cdot \frac{1}{25000 \text{ h}} = 10 \text{ fit} = 0.001 \% / 1000 \text{ h}$$

Failure rate specifications must include failure criteria, operating conditions and ambient conditions.

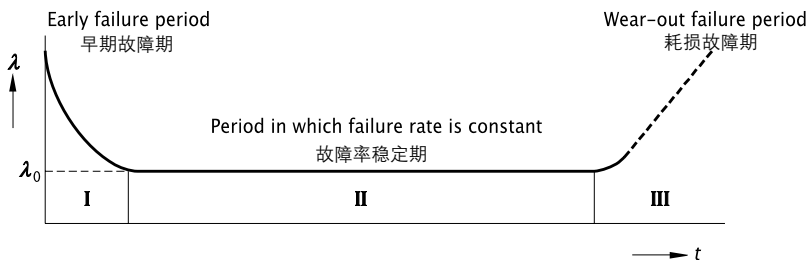
Usually the failure rate of components, when plotted against time, shows a characteristic curve with the following three periods:

I: early failure period, II: useful period, III: wear-out failure period

故障率规范必须包括故障标准、工作条件及环境条件。

按时间制图, 元件的故障率通常表现为具有以下三个时期的特征曲线:

I: 早期故障期; II: 使用期; III: 耗损故障期



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Unless otherwise specified, the failure rate refers to the useful period (II). During this period, an approximately constant failure rate λ_0 can be assumed.

除非另行说明, 故障率是指第二个时期——使用期。在这一时期内, 可以假设一个大致恒定的故障率 λ_0 。

1.8.2 Conversion factors for failure rates

The conversion factors for different load conditions can be derived from EN 61709.

1.8.2 故障率的换算系数

不同负载条件的换算系数可根据 EN 61709 获取。

1.9 Traceability

At all stages of production, components are identified by papers accompanying each batch. The completion of manufacturing and testing steps are confirmed and documented. This ensures the traceability of a batch.

After shipment, traceability is ensured by a code on the packing.

1.10 Electrical and mechanical properties

The measuring conditions can be found in the chapter "General technical information". The product data and relevant tolerance limits are defined in the respective data sheets.

1.11 Dimensions

The dimensional drawings in the individual data sheets are definitive for the dimensions.

1.12 Finish

Assessment of the finish of aluminum electrolytic capacitors is performed to EPCOS finish specifications. These are based on IEC 60384-4.

1.13 AQL values

The AQL (AQL = acceptable quality level) figures are based on a random sampling plan to DIN ISO 2859-1 (contents compliant with MIL STD 105D and IEC 60410).

The sampling instructions of this standard are such that a delivered lot will be accepted with a probability of $\geq 90\%$ if the percentage of non-conformancies does not exceed the stated AQL figure. As a rule, the percentage of non-conformancies in deliveries from EPCOS is significantly below the AQL figure. The acceptance value we apply to inoperatives, i.e. unusable components is $c = 0$.

1.9 可追溯性

在生产各阶段，元件根据每批随附的文件来识别。完成制造和测试环节后，要确认并存档，以便确保每批次的可追溯性。

出货后，可通过包装上的条码确保可追溯性。

1.10 电气和机械属性

有关测量条件，参见《常用技术信息》；产品资料和相关公差限度在相关规格书上有说明。

1.11 尺寸

独立规格书中的尺寸图即为最终尺寸。

1.12 成品

铝电解电容器成品的评估按照爱普科斯成品规范执行，以IEC 60384-4为基准。

1.13 允许质量指标值

允许质量指标（AQL）值基于随机抽样按照DIN ISO 2859-1（内容与MIL STD 105D 和 IEC 60410 相符）获取。

本标准的抽样说明规定，在不合格产品百分比不超过规定的AQL值的前提下，当合格率大于或等于90%时，该批次即可接受交付。根据惯例，爱普科斯交付的不合格产品百分比远低于AQL值。我们用于无效元件（即不可用元件）的合格判断值为： $c = 0$ 。

1.13.1 Classification of inoperatives / non-conformancies

A non-conformancy exists if a component characteristic fails to meet the data sheet specifications or an agreed delivery specification. Inoperatives are totally unusable components (to CECC).

Inoperatives

- Wrong or missing marking
(when specified, and provided the consequence can be misapplication)
- Missing or useless terminals
- Broken or missing encapsulation (if encapsulation is specified)
- Short or open circuits
- Capacitance outside three times the application tolerance
- Marking: polarity, if missing
- Leakage current more than 10 times the limiting value or $100 \geq \mu\text{A}$; whichever is greater
- Impedance outside three times limit value
Alternating orientation of taped components
- Mixing with other component types

Non-conformancies

non-conformancies in electrical characteristics

(electrical characteristics outside of specified limits)

non-conformancies in mechanical properties

(e.g. wrong dimensions, damaged case, illegible marking, bent terminals).

1.13.2 AQL figures

The following AQL figures apply the non-conformancies listed above:

-inoperatives (electrical and mechanical)	0.065
-sum of electrical non-conformancies	0.25
-sum of mechanical non-conformancies	0.25

1.13.1 无效或不合格元件的分类

如果一个元件的特性不满足规格书规范或协定的交付规范，即视为不合格。无效元件为彻底不可用元件（根据CECC）。

无效元件包括：

- 误标或没有标记
(在明确后，假设会造成误用)。
- 端子遗漏或无用
- 封装损坏或缺少
- 电路短路或开路
电容超过应用公差三倍时
- 标志：极性，如果遗漏
- 漏电流大于限值的十倍或大于等于
100 μA ；取两者更高者
- 阻抗大于限值三倍
- 更改了编带装元件的方向
- 与其它元件型号混淆

不合格元件

- 电气特性不合格
(电气特性超过规定限值)
- 机械属性不合格
(如：尺寸错误、包装箱损坏、标签模糊、端子弯曲)

1.13.2 允许质量指标数值

下列允许质量指标数值适用于上述不合格元件：

失效元件（电气和机械）	0.065
电气不合格总值	0.25
机械不合格总值	0.25

1.14 Conditions of use

EPCOS products may only be used in line with the technical specifications and installation instructions and must comply with the state of the art. Non-observance of limits, operating conditions or handling guidelines can lead to disturbances in the circuit and other undesirable consequences such as a higher failure rate.

In this connection, please note the "Important notes" on page 2.

Should you have any application-referred questions, please contact our experts, who will be pleased to advise you.

1.15 Customer complaints

If a fault occurs in a product despite careful manufacture and testing, please contact your local sales organization. They will register your complaint as an RMA⁵⁾ process and forward it to the relevant technical departments for rapid handling.

EPCOS treats technical complaints according to the 8D⁶⁾ methodology; i.e. with the use of interdisciplinary teams who aim to implement rapid countermeasures and sustained corrections and answer all complaints with an 8D report.

In order to be able to deal quickly and smoothly with complaints, the following data are helpful:

- Number of components subject to complaint or returned
- Fault description
- How and when was the fault detected?
- Logistics data (date code, delivery note no.)
- Operating conditions
- Operating duration up to occurrence of the fault
- Measurement parameters in the case of divergent technical data

In the event of transport damage, we would ask you to describe this in more detail and if required to mark it so that it can be distinguished from any further damage sustained during the return shipment. The original package should also be checked and any damage to be described. In order to avoid further damage, the original packaging should also be used for the return shipment.

In case of receiving a damaged delivery, please document this damage with a signature of the forwarding company on the delivery papers.

1.14 使用条件

爱普科斯产品仅当符合技术规范 and 安装说明、且符合现有技术标准时方可使用。如不遵守限值、操作条件或操作指导方针，将可能导致电路中断及其它不良后果（如更高失效率等）。

有关详情请查阅第二页的“重要事项”。

如果您在使用方面有任何疑问，请联系爱普科斯专家。随时欢迎垂询。

1.15 客户投诉

尽管制作谨慎、检查仔细，但如果发现产品故障，请立即联系当地销售机构。他们会将您的投诉登记在退料审查（RMA⁵⁾）程序中，并反应给相关技术部门，并尽快处理。

爱普科斯按照问题解决8步法（8D⁶⁾）处理质量投诉，即由跨功能小组执行快速对策和采取持续纠正措施，用8D报告回应所有投诉。

为快速、有效处理投诉问题，请提供下列信息：

- 投诉或退回元件的编号
- 故障描述
- 何时及如何发现的故障
- 物流信息（日期编号、交付备注编号）
- 操作条件
- 到故障发生时的操作时间
- 出现技术信息偏差时的测量参数

对于在运输过程中发生的损坏，请提供详细信息，并作标记（如爱普科斯要求），以便区别于返回过程中发生的其它破损。原始包装也应检查，如有损坏应加以描述。为了避免进一步的损坏，返回途中也应使用原始包装。

如果交货过程中出现了损坏，请在运输公司的交货单做记录并签字。

2 Environmental management system

2.1 Environmental policy

Our fundamental commitment to environmental protection is laid down in the EPCOS environmental policy.

EPCOS defines the following environmental protection principles:

- Above and beyond statutory and administrative requirements, we are continuously working to minimize the burden on the environment and to reduce consumption of energy and natural resources.
- We are taking all precautions necessary to protect our environment against damage.
- Potential impact on the environment is assessed and incorporated in product and process planning at the earliest possible stage.
- Our environmental management system ensures that our environmental protection principles are effectively put into practice. The technical and organizational procedures required are regularly monitored and updated.
- Each employee is required to act in an environmentally conscious manner. It is the constant duty of management to increase and encourage awareness of responsibility at all levels.
- We work with our business partners to promote conformity with similar objectives. We supply our customers with information on ways to minimize any potentially adverse environmental impacts of our products. We work in a spirit of cooperation with the relevant authorities.
- We inform the public of the impact on the environment caused by the company and our activities related to the environment.

2 质量管理体系

2.1 环境政策

爱普科斯环境保护的根本在于爱普科斯环境政策。

爱普科斯规定了以下环保原则：

- 降低对环境的负担，减少能源和自然资源消耗。
- 采取一切必要措施保护环境免受破坏。
- 尽早评估对环境的潜在影响，并将其纳入产品和工艺策划中。
- 公司的环境管理体系确保有关环保准则能够有效付诸实践。
- 每位员工在实际工作中都有环保意识。公司管理层有责任增强和鼓励各阶层的责任意识。
- 与众多商业伙伴一起合作，争取实现相关目标；为顾客提供各种可降低产品对环境不利影响的信息；与相关权威机构进行合作。
- 将公司对环境的影响及与环境相关的活动告知公众。

2.2 Environmental management system

The EPCOS ISO 14001 based environmental management system is applied company wide for implementing the EPCOS environmental policy. It is posted on the EPCOS Intranet and is thus accessible to all employees.

2.3 Certification

The EPCOS Group operates an environmental management system that conforms to the requirements of ISO 14001 and is mandatory for all plants. The company certificate is posted on the EPCOS internet:

(www.epcos.com/environmental_management).

2.4 RoHS

The term "RoHS-compatible" shall mean the following:

The components described as "RoHS-compatible" are compatible with the requirements of the regulations listed below ("Regulations") and with the requirements of the provisions which will result from transformation of the Regulations into national law to the extent such provisions reflect the Regulations:

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive 2002/95/EC"); Commission Decision of 18 August 2005 amending Directive 2002/95/EC (2005/618/EC); Commission Decision of 13 October 2005 and of 21 October 2005 amending the Annex to Directive 2002/95/EC (2005/717/EC, 2005/747/EC, 2006/310/EC, 2006/690 ... 692/EC).

2.2 环境管理体系

公司广泛采用基于爱普科斯 ISO 14001的环境管理体系，用以执行环境政策；公司所有员工均可登录爱普科斯网站了解有关内容。

2.3 认证

爱普科斯集团执行的环境管理体系符合ISO 14001要求，在所有工厂内强制执行。公司认证书参见爱普科斯网站（www.epcos.com/environmental_management）。

2.4 RoHS指令

“符合RoHS”有以下含义：

标有“符合RoHS”标记的元件指符合下列规定要求，并符合特定条款要求（有关条款源自《RoHS法规》转换而成的国家法律，为《RoHS法规》重点内容）：

欧盟议会及2003年1月27日理事会关于限制在电子电气设备中使用某些有害物质的2002/95/EC号指令（“2002/95/EC指令”）；2005年8月18日委员会决议修订的2002/95/EC指令（“2005/618/EC”）2005年10月13日及2005年10月21日委员会决议修订的2002/95/EC指令的附录（2005/717/EC、2005/747/EC、2006/310/EC、2006/690 ... 692/EC）。

2.5 Banned and hazardous substances in components

As a manufacturer of passive components, we develop our products on the basis of sustainability. In order to guarantee a standardized procedure for EPCOS worldwide, a mandatory list of banned substances and substances of special interest is part of our environmental management system. The planning and development instructions include regulations and guidelines that aim to identify environmental aspects and to optimize products and processes with respect to material use and environmental compliance, to design them with sparing use of resources and to substitute hazardous substances as far as possible.

Consideration of the environmental aspects is checked and recorded in the design reviews: the environmental officer provides support in the assessment of the environmental impacts of a development project.

2.6 Material data sheets for product families

EPCOS posts material data sheets on the Internet (www.epcos.com/material) that show typical compositions of product groups by selected representatives. The materials are listed with their percentage weight distribution referred to the respective component.

As per IEC 61906 PAS, all materials with a weight percentage exceeding 0.1 are listed. All specifications are typical data and may vary slightly within a product group or production lot.

The material data sheets do not represent guaranteed properties, but are merely given for purposes of information.

Please note in this connection the "Important notes" on page 2.

2.7 Disposal

All aluminum electrolytic capacitors can be disposed off, reused or recycled. However as disposal is regulated by national law, the respective national provisions have to be observed.

2.5 电子元件禁用物质和危险物质

作为无源元件制造商，爱普科斯产品的开发以可持续为基础。为确保爱普科斯在全球范围内使用标准化程序，我们也将禁止物质强制清单及特殊用物质强制清单纳入了环境管理体系。策划和开发指南包括旨在识别环境因素、在材料使用和达到环保要求方面优化产品和工艺、设计服从节约资源原则、尽可能代替有害物质等系列规定和方针。

设计审查时，应确认是否考虑到环境因素，是否记录在案：环保人员应在提供开发项目的环境影响评估方面提供技术支持。

2.6 产品系列材料规格书

爱普科斯将材料规格书发布在网站上（www.epcos.com/material），选取代表产品说明产品的典型成份。所列材料均附有所含成份的重量分配百分比。

按照IEC 61906 PAS，所有重量百分比超过0.1的材料均有列出。所有规格的数据均有代表性，同类产品或同一批产品中可能稍有不同。有关材料规格书不代表性能保障，仅供信息参考。

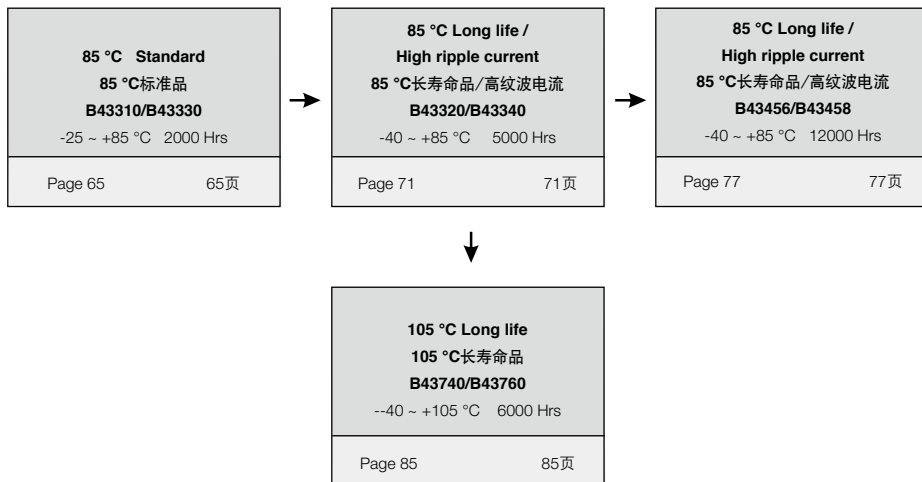
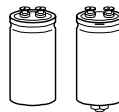
有关方面，请查阅第二页“重要事项”。

2.7 处理

所有铝电解电容器均可完全处置、再利用或回收。不过，在处理时应遵守国家法律的相关规定。

Alumium electrolytic capacitors chart 铝电解电容器产品体系图

Screw series chart 螺钉式产品体系图





85 °C Standard 85 °C标准品 B41231/B43231 -40(-25) ~ +85 °C 2000 Hrs Page 107 107页	→	85 °C Long life 85 °C长寿命品 B43232 -40(-25) ~ +85 °C 3000 Hrs Page 125 125页	→	85 °C Long life 85 °C长寿命品 B43501 -40(-25) ~ +85 °C 10000 Hrs Page 133 133页
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4-Pin
4-针式

4-Pin
4-针式

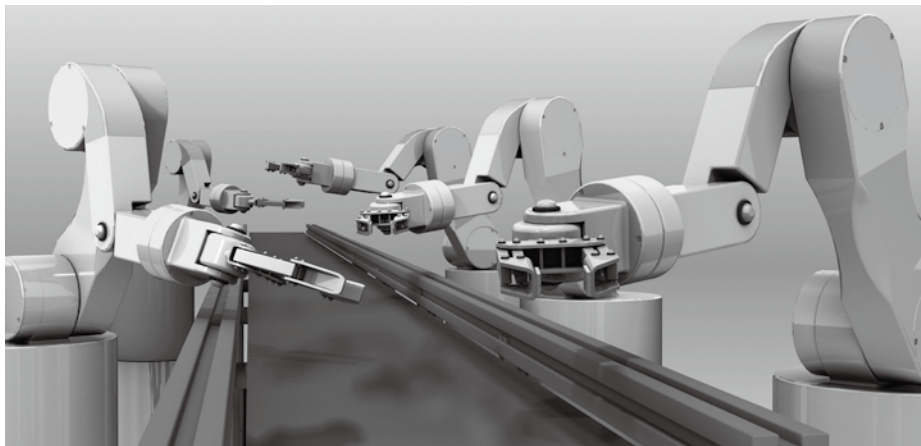
85 °C Compact 85 °C小型化 B43510 -40 (-25) ~ +85 °C 5000 Hrs Page 139 139页	→	85 °C Outstanding ripple current 85 °C纹波电流优良型 B43511 -40(-25) ~ +85 °C 12000 Hrs Page 145 145页
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105 °C Standard 105 °C标准品 B41252/B43252 -40 (-25) ~ +105 °C 2000 Hrs Page 151 151页	→	105 °C Long life 105 °C长寿命品 B43254 -40 (-25) ~ +105 °C 3000 Hrs Page 169 169页	→	105 °C Long life 105 °C长寿命品 B43255 -40(-25)~+105 °C 5000 Hrs Page 181 181页
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105 °C Compact / high ripple current 105 °C小型化 / 高纹波电流 B43256 -40(-25) ~ +105 °C 3000 Hrs Page 189 189页	→	105 °C Ultra compact 105 °C超小型化 B43508 -40(-25) ~ +105 °C 3000 Hrs Page 199 199页
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Aluminum electrolytic capacitors list 铝电解电容器产品一览表

Category 分类	S/N 系列号	Page 页	Feature/purpose 特性 / 用途	Standard 标准品	Small/ thin 小型 薄型化	Long life 长寿命	Highly reliable 高可靠	Operating temperature range 工作温度范围 (°C)	Standard life 标准寿命 (hours)	Rated voltage range 额定电压 范围(Vdc)
screw terminal 螺钉式	B43310/ B43330	65	85 °C standard 85 °C标准品	●				-25 ~ +85	2000	400 ~ 450
	B43320/ B43340	71	85 °C long life / high ripple current 85 °C长寿命品 / 高纹波电流			●	●	-40 ~ +85	5000	350 ~ 450
	B43456/ B43458	77	85 °C long life / high ripple current 85 °C长寿命品 / 高纹波电流			●	●	-40 ~ +85	12000	350 ~ 500
	B43740/ B43760	85	105 °C long life 105 °C长寿命品			●	●	-40 ~ +105	6000	350 ~ 450
Snap-in 焊片式	B41231/ B43231	107	85 °C standard / switch- mode power supply and consumer electronics 85 °C标准品 / 开关电源及消 费电子	●				-40 (-25) ~ +85	2000	10 ~ 500
	B43232	125	85 °C long life, switch-mode power supply and consumer electronics 85 °C长寿命品 / 开关电源及 消费电子	●		●		-40 (-25) ~ +85	3000	200 ~ 450
	B43501	133	85 °C long life, highly reliable / industrial frequency converter, UPS, switch-mode power supply 85 °C长寿命、高可靠性 / 工 业变频、UPS、开关电源			●	●	-40 (-25) ~ +85	10000	400 ~ 450
	B43510	139	85 °C compact, highly reliable / industrial frequency converter, UPS, switch-mode power supply 85 °C小型化、高可靠性 / 工业变频、UPS、开关电源		●	●	●	-40 (-25) ~ +85	5000	385 ~ 500
	B43511	145	85 °C long life, highly reliable / industrial frequency converter, UPS, switch-mode power supply 85 °C长寿命、高可靠性 / 工 业变频、UPS、开关电源			●	●	-40 (-25) ~ +85	12000	350 ~ 450
	B41252/ B43252	151	105 °C standard / switch- mode power supply and consumer electronics 105 °C标准品、开关电源及 消费电子	●				-40 (-25) ~ +105	2000	10 ~ 500
	B43254	169	105 °C long life, switch-mode power supply / industrial application, consumer electronics 105 °C长寿命、开关电源 / 工业应用、消费电子			●		-40 (-25) ~ +105	3000	160 ~ 450
	B43255	181	105 °C long life, highly reliable / industrial power supply, industrial frequency converter 105 °C长寿命、高可靠性 / 工业电源、工业变频器			●	●	-40 (-25) ~ +105	5000	200 ~ 450
	B43256	189	105 °C Small volume, high ripple / professional power supply 105 °C小体积、高纹波 / 专 业电源		●			-40 (-25) ~ +105	3000	160 ~ 450
	B43508	199	105 °C Ultra compact, high ripple / professional power supply 105 °C超小型化、高纹波 / 专业电源		●			-40 (-25) ~ +105	3000	200 ~ 450



Page
页码

Capacitors with screw terminals
螺钉式电容器

Selection chart 选型图	64
Capacitors with screw terminals 螺钉式电容器	65
Special design specifications 特殊设计说明	93
Accessories 附件	97

Capacitors with screw terminals 螺钉式电容器

Selection chart 选型图

High-voltage series

高压系列

85°C

Standard industrial
标准工业型

B43310 / B43330	
400 ... 450 V	
85 °C / > 2000 h	
Page 65	65页

Long life industrial
长寿命工业型

B43320 / B43340	
350...450V	
85 °C / > 5000 h	
Page 71	71页

Longlife industrial
长寿命工业型

B43456 / B43458	
350 ... 450 V	
85 °C / > 12000 h	
40 °C / > 250000 h	
Page 77	77页

Extra long life industrial
超长寿命工业型

B43740 / B43760	
350 ... 450 V	
105 °C / > 6000 h	
Page 85	85页

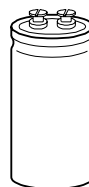
General purpose grade capacitors

通用级电容器

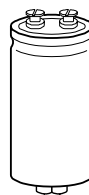
Applications

应用

- Uninterruptible power supplies
不间断电源
- Frequency converters
变频器



B43310



B43330

Features

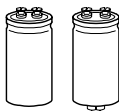
特点

- All-welded constructions ensure reliable electrical contact
全焊结构，确保可靠的电气接触性
- High reliability and high ripple current capability
高可靠性与高耐纹波电流能力
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge-discharge proof, polar
耐冲放电，有极性
- Aluminum case with insulating sleeve
铝制外壳，带绝缘套管
- Poles with screw terminal connections
螺钉连接电极
- Mounting with ring clips, clamps or threaded stud
采用卡夹/卡环或底部螺栓安装
- The bases of types with threaded stud and $d \leq 76.9$ mm are not insulated, types with $d = 91.0$ mm have fully insulated bases.
使用底部螺栓，且 $d \leq 76.9$ mm 的型号底部不绝缘； $d = 91.0$ mm 的型号底部完全绝缘



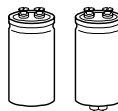
B43310, B43330

Standard industrial – 85 °C 标准工业型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	400 ... 450 V DC				
Surge voltage V_S 浪涌电压 V_S	$1.10 \cdot V_R$				
Operating temperature range 工作温度范围	-25 °C ... + 85 °C				
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	1000 ... 15000 mF				
Capacitance tolerance 电容量公差	± 20% M				
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	2000 h		Requirements: 要求 $\Delta C/C \leq \pm 15\%$ of initial value $\leq \pm 15\%$ 的初始值 $\tan \delta \leq 1.75$ times initial specified limit ≤ 1.75 倍初始规定值 $I_{leak} \leq$ initial specified limit $\leq$ 初始规定值		
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.008 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$ or 5 mA whichever is smaller (5 mA 或取最小值)				
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	0.2				
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	400	450		
	$Z(-25 \text{ °C})$	8	6		
	$Z(+20 \text{ °C})$				
Shelf life 储存寿命	After storage for 1000 h at 85 °C,the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。				
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
	0.70	1.00	1.20	1.33	1.40
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C		+70 °C	+85 °C
	2.65	2.29		1.79	1.00
Sectional specification 分规范	IEC 60384-4				



Ripple current capability

耐纹波电流能力

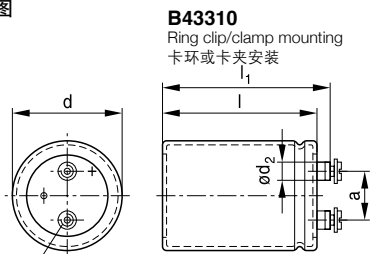
Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

因为接触元件的耐纹波电流能力限制，工作电流不得超过下表的极限值：

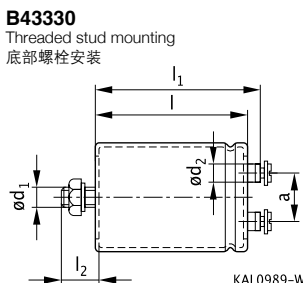
Capacitor diameter 电容器直径	51.6 mm	64.3 mm	76.9 mm	91.0 mm
$I_{AC,max}$	34 A	45 A	57 A	80 A

Dimensional drawings

尺寸图



KAL1127-X-E



KAL0989-W

M5: Min. reach of screw = 8 mm

M5: 螺纹最小深度 = 8 mm

M6: Min. reach of screw = 10 mm

M6: 螺纹最小深度 = 10 mm

Positive pole marking: +

正极标志: +

For B43330 capacitors with threaded stud and $d \leq 76.9$ mm the base is not insulated. type with $d = 91.0$ mm have fully insulated bases.

带底部螺栓且 $d \leq 76.9$ mm 的 B43330 电容器，其底部不绝缘， $d = 91.0$ mm 的型号底部完全绝缘。

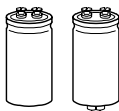
For non-insulated and insulated mounting instructions and accessories, refer to chapter "Screw terminals – accessories".

关于非绝缘安装及绝缘安装说明及附件，参阅章节“螺钉式电容器 - 附件”。

Dimensions and weights

尺寸与重量

Terminal 端子	Dimensions (mm) with insulating sleeve 带绝缘套管的尺寸 (mm)							Approx. weight (g) 约计重量(克)
	d	$l +3/-0$	$l_1 +3/-0$	$l_2 +0/-1$	d_1	$d_2 \text{ max.}$	$a +0.2/-0.4$	
M5	51.6 +0/-0.8	130	136.0	17	M12	11.4	22.2	350
M5	64.3 +0/-0.8	96	101.2	17	M12	13.2	28.5	400
M5	64.3 +0/-0.8	115	120.2	17	M12	13.2	28.5	490
M5	64.3 +0/-0.8	130	135.2	17	M12	13.2	28.5	540
M6	76.9 +0/-0.7	115	120.2	17	M12	17.7	31.7	620
M6	76.9 +0/-0.7	130	135.2	17	M12	17.7	31.7	770
M6	76.9 +0/-0.7	155	160.2	17	M12	17.7	31.7	990
M6	91.0 +0/-2	157	161.8	17	M12	17.7	31.7	1400
M6	91.0 +0/-2	196	200.8	17	M12	17.7	31.7	1600
M6	91.0 +0/-2	220	224.8	17	M12	17.7	31.7	1900
M6	91.0 +0/-2	236	240.8	17	M12	17.7	31.7	2200



B43310, B43330

Standard industrial – 85 °C 标准工业型 – 85 °C

Packing

包装

Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位 (件)	Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位 (件)
51.6 mm	22	76.9 mm	12
64.3 mm	15	91.0 mm	8

For ecological reasons the packing is pure cardboard.

为保护生态环境，包装仅使用纸板。

Accessories

附件

The following items are included in the delivery package, but are not fastened to the capacitors:

以下物品已包含在交货包装中，但没有固定到电容器上：

	Thread 螺纹	Toothed washers 带齿垫圈	Screws/nuts 螺钉或螺帽	Maximum torque 最大扭矩
For terminals 用于端子	M5	—	Outer hex-cross screw with spring and plain washer M5 × 10 外六角十字型螺钉及弹垫垫圈和平垫圈 M5 × 10	2.5 Nm
	M6	—	Outer hex-cross screw with spring and plain washer M6 × 12 外六角十字型螺钉及弹垫垫圈和平垫圈 M6 × 12	4.0 Nm
For mounting ¹⁾ 用于安装 ¹⁾	M12	J 12.5 DIN 6797	Hex nut BM 12 DIN 439 六角螺母 BM 12 DIN 439	10 Nm

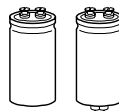
The following items must be ordered separately. For details, refer to chapter "Screw terminals – accessories".

以下物品需要另外购买。详情参阅章节“螺钉式电容器 – 附件”。

Item 物品	Type 型号
Ring clips 卡环	B44030
Clamps for capacitors with $d \geq 64.3$ mm 电容器用卡夹, $d \geq 64.3$ mm	B44030
Insulating parts 绝缘部件	B44020

¹⁾ with different mounting method, this item is not always required. it will be delivered upon customer request accordingly.

由于安装方式不同，该配件不一定都适用。仅当客户提出需求时，EPCOS将配送该部件。



Technical data and ordering codes

技术参数与订货编码

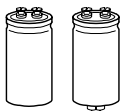
V_R	C_R	Case dimensions	ESR_{typ}	$I_{AC,max}$	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 20 °C m Ω	120 Hz 40 °C A	120 Hz 85 °C A	订货编码
400	1000	51.6 × 65	138	7.5	2.8	B433*0A9108M0#0
	2200	51.6 × 130	87	17.3	6.5	B433*0A9228M0#0
	2200	51.6 × 105	65	16.5	6.2	B433*0B9228M0#0
	2200	64.3 × 96	87	17.0	6.4	B433*0C9228M0#0
	2700	64.3 × 96	71	18.9	7.1	B433*0A9278M0#0
	3300	64.3 × 105	45	22.1	8.3	B433*0B9338M0#0
	3300	64.3 × 115	58	22.6	8.5	B433*0A9338M0#0
	3900	64.3 × 115	38	21.3	8.0	B433*0B9398M0#0
	3900	64.3 × 130	49	25.8	9.7	B433*0A9398M0#0
	4700	76.9 × 105	32	27.1	10.2	B433*0B9478M0#0
	4700	76.9 × 115	41	28.5	10.7	B433*0A9478M0#0
	5600	76.9 × 130	34	32.5	12.2	B433*0A9568M0#0
	6800	76.9 × 143	24	37.2	14.0	B433*0B9688M0#0
	6800	76.9 × 155	28	38.8	14.6	B433*0A9688M0#0
	8200	91.0 × 144	20	43.1	16.2	B433*0B9828M0#0
	8200	91.0 × 157	23	44.7	16.8	B433*0A9828M0#0
	10000	91.0 × 130	19	45.2	17.0	B433*0C9109M0#0
	10000	91.0 × 157	19	49.2	18.5	B433*0A9109M0#0
	12000	91.0 × 170	15	55.9	21.0	B433*0B9129M0#0
	12000	91.0 × 196	16	59.6	22.4	B433*0A9129M0#0
	15000	91.0 × 220	13	69.7	26.2	B433*0A9159M0#0
	18000	91.0 × 236	11	78.2	29.4	B433*0A9189M0#0

Composition of ordering code

订货编码内容

- * = Mounting style
安装方式
- 1 = for capacitors with ring clip/clamp mounting
采用卡环、卡夹安装
- 3 = for capacitors with threaded stud
底部螺栓安装

- # = Insulation feature
绝缘特点
- 0 = PVC insulation
PVC绝缘
- 6 = PET insulation
PET绝缘



B43310, B43330

Standard industrial – 85 °C 标准工业型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	ESR_{typ}	$I_{AC,max}$	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 20 °C m Ω	120 Hz 40 °C A	120 Hz 85 °C A	订货编码
450	1800	51.6 × 130	102	16.0	6.0	B433*0A5188M0#0
	2200	51.6 × 130	83	18.1	6.8	B433*0C5228M0#0
	2200	64.3 × 96	83	17.3	6.5	B433*0A5228M0#0
	2700	64.3 × 115	68	20.7	7.8	B433*0A5278M0#0
	3300	64.3 × 130	55	24.2	9.1	B433*0A5338M0#0
	3900	76.9 × 115	49	25.8	9.7	B433*0A5398M0#0
	4700	76.9 × 115	32	26.3	9.9	B433*0C5478M0#0
	4700	76.9 × 130	41	29.8	11.2	B433*0A5478M0#0
	5600	76.9 × 155	34	35.4	13.3	B433*0A5568M0#0
	6800	91.0 × 157	28	40.7	15.3	B433*0A5688M0#0
	8200	91.0 × 157	23	44.7	16.8	B433*0A5828M0#0
	10000	91.0 × 196	19	54.3	20.4	B433*0A5109M0#0
	12000	91.0 × 220	16	62.5	23.5	B433*0A5129M0#0
	15000	91.0 × 236	13	72.1	27.1	B433*0A5159M0#0

Composition of ordering code

订货编码内容

- * = Mounting style
安装方式
- 1 = for capacitors with ring clip/clamp mounting
采用卡环、卡夹安装
- 3 = for capacitors with threaded stud
底部螺栓安装

- # = Insulation feature
绝缘特点
- 0 = PVC insulation
PVC绝缘
- 6 = PET insulation
PET绝缘

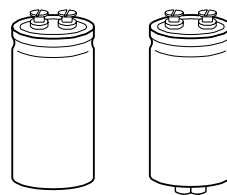
Long life Grade Capacitors

长寿命级电容器

Applications

应用

- Uninterruptible power supplies
不间断电源
- Frequency converters
变频器
- Solar and wind power generator
太阳能和风力发电设备



B43320

B43340

Features

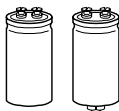
特点

- All-welded construction ensures reliable electrical contact
全焊结构，确保可靠的电气接触性
- High reliability and high ripple current capability
高可靠性及高耐纹波电流能力
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge-discharge proof, polar
耐充放电，有极性
- Aluminum case with insulating sleeve
铝质外壳，带绝缘套管
- Poles with screw terminal connections
螺钉连接电极
- Mounting with ring clips, clamps or threaded stud
采用卡环/卡夹或底部螺栓安装
- The bases of types with threaded stud and $d \leq 76.9$ mm are not insulated, types with $d = 91.0$ mm have fully insulated bases.
使用底部螺栓，且 $d \leq 76.9$ mm 的型号底部不绝缘； $d = 91.0$ mm 的型号底部完全绝缘



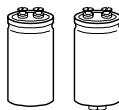
B43320, B43340

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	350 ... 450 V DC					
Surge voltage V_S 浪涌电压 V_S	$1.10 \cdot V_R$					
Operating temperature range 工作温度范围	-40 °C ... + 85 °C					
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	1000 ... 18000 mF					
Capacitance tolerance 电容量公差	± 20% M					
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	5000 h		Requirements: 要求 $\Delta C/C \leq \pm 15\%$ of initial value $\leq \pm 15\%$ 的初始值 $\tan \delta \leq 1.75$ times initial specified limit ≤ 1.75 倍初始规定值 $I_{leak} \leq$ initial specified limit $\leq$ 初始规定值			
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.008 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$ or 5 mA whichever is smaller (5 mA 或取最小值)					
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	0.2					
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	350	400	450		
	$Z(-40\text{ °C})$	22	20	16		
	$Z(+20\text{ °C})$					
Shelf life 储存寿命	After storage for 1000 h at 85 °C,the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。					
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more	
	0.68	1.00	1.22	1.36	1.40	
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C		+70 °C	+85 °C	
	1.92	1.75		1.46	1.00	
Sectional specification 分规范	IEC 60384-4					



Ripple current capability

耐纹波电流能力

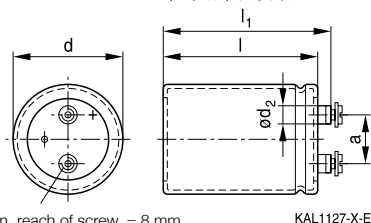
Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

因为接触元件的耐纹波电流能力限制，工作电流不得超过下表的极限值：

Capacitor diameter d 电容器直径 d	51.6 mm	64.3 mm	76.9 mm	91.0 mm
IAC,max	34 A	45 A	57 A	80 A

B43320

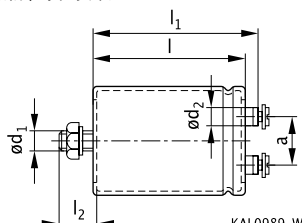
Ring clip/clamp mounting
卡环或卡夹安装



KAL1127-X-E

B43340

Threaded stud mounting
底部螺栓安装



KAL0989-W

M5: Min. reach of screw = 8 mm
M5: 螺纹最小深度 = 8 mm
M6: Min. reach of screw = 10 mm
M6: 螺纹最小深度 = 10 mm
Positive pole marking: +
正极标志: +

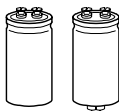
B43340 with threaded stud and $d \leq 76.9$ mm the base is not insulated. type with $d = 91.0$ mm have fully insulated bases.

带底部螺栓且 $d \leq 76.9$ mm 的 B43340 电容器，其它底部不绝缘。 $d = 91.0$ mm 的型号底部完全绝缘。

Dimensions and weights

尺寸与重量

Terminal 端子	Dimensions (mm) with insulating sleeves 含绝缘套管的尺寸(mm)							Approx. weight (g) 大约重量(克)
	d	l+3/-0	l ₁ +3/-0	l ₂ +0/-1	d ₁	d ₂ max	a +0.2/-0.4	
M5	51.6 +0/-0.8	75	81	17	M12	11.4	22.2	230
M5	51.6 +0/-0.8	96	102	17	M12	11.4	22.2	290
M5	51.6 +0/-0.8	130	136	17	M12	11.4	22.2	360
M5	64.3 +0/-0.8	96	101.2	17	M12	13.2	28.5	415
M5	64.3 +0/-0.8	115	120.2	17	M12	13.2	28.5	505
M5	64.3 +0/-0.8	130	135.2	17	M12	13.2	28.5	555
M5	64.3 +0/-0.8	155	160.2	17	M12	13.2	28.5	655
M5	64.3 +0/-0.8	195	200.2	17	M12	13.2	28.5	865
M6	76.9 +0/-0.7	115	120.2	17	M12	17.7	31.7	640
M6	76.9 +0/-0.7	130	135.2	17	M12	17.7	31.7	790
M6	76.9 +0/-0.7	155	160.2	17	M12	17.7	31.7	1010
M6	91.0 +0/-2	157	161.8	17	M12	17.7	31.7	1430
M6	91.0 +0/-2	196	200.8	17	M12	17.7	31.7	1630
M6	91.0 +0/-2	236	240.8	17	M12	17.7	31.7	2230



B43320, B43340

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Packing

包装

Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位(件)
51.6 mm	22
64.3 mm	15

Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位(件)
76.9 mm	12
91.0 mm	8

For ecological reasons the packing is pure cardboard.
为保护生态环境，包装仅使用纸板。

Accessories

附件

The following items are included in the delivery package, but are not fastened to the capacitors:

以下物品已包含在交货包装中，但没有固定到电容器上：

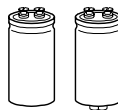
	Thread 螺纹	Toothed washers 带齿垫圈	Screws/nuts 螺钉或螺帽	Maximum torque 最大扭矩
For terminals 用于端子	M5	—	Outer hex-cross screw with spring and plain washer M5 × 10 外六角十字型螺钉弹垫垫圈和平垫圈 M5 × 10	2.5 Nm
	M6	—	Outer hex-cross screw with spring and plain washer M6 × 12 外六角十字型螺钉及弹垫垫圈和平垫圈 M6 × 12	4.0 Nm
For mounting ¹⁾ 用于安装 ¹⁾	M12	J 12.5 DIN 6797	Hex nut BM 12 DIN 439 六角螺母 BM 12 DIN 439	10 Nm

The following items must be ordered separately. For details, refer to chapter "Screw terminals – accessories".
以下物品需要另外购买。详情参阅章节“螺钉式电容器 – 附件”。

Item 物品	Type 型号
Ring clips 卡环	B44030
Clamps for capacitors with $d \geq 64.3$ mm 电容器用卡夹, $d \geq 64.3$ mm	B44030
Insulating parts 绝缘部件	B44020

¹⁾ with different mounting method, this item is not always required. it will be delivered upon customer request accordingly.

由于安装方式不同，该配件不一定都适用。仅当客户提出需求时，EPCOS将配送该部件。



Technical data and ordering codes

技术参数与订货编码

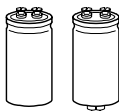
V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C m Ω	$I_{AC,max}$ 120 Hz 40 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
350	1200	51.6 x 75	107.8	10.4	5.5	B433*0A4128M0#0
	1500	51.6 x 75	85.8	11.5	6.1	B433*0A4158M0#0
	1800	51.6 x 96	72.6	14.0	7.4	B433*0A4188M0#0
	2200	51.6 x 96	58.3	15.5	8.2	B433*0A4228M0#0
	2700	51.6 x 130	48.4	19.3	10.2	B433*0A4278M0#0
	3300	51.6 x 130	38.5	21.4	11.3	B433*0A4338M0#0
	3900	64.3 x 115	33	24.2	12.8	B433*0A4398M0#0
	4700	64.3 x 130	26.4	28.0	14.8	B433*0A4478M0#0
	5600	64.3 x 155	23.1	32.7	17.3	B433*0A4568M0#0
	5600	76.9 x 115	23.1	30.8	16.3	B433*0C4568M0#0
	6800	64.3 x 195	18.7	39.9	21.1	B433*0A4688M0#0
	6800	76.9 x 130	18.7	35.5	18.8	B433*0C4688M0#0
	8200	76.9 x 155	15.4	41.8	22.1	B433*0A4828M0#0
	10000	91.0 x 157	13.2	49.0	25.9	B433*0A4109M0#0
	12000	91.0 x 157	9.9	53.7	28.4	B433*0A4129M0#0
	15000	91.0 x 196	8.8	65.4	34.6	B433*0A4159M0#0
	18000	91.0 x 236	8.8	77.7	41.1	B433*0A4189M0#0
400	1000	51.6 x 75	128.7	9.5	5.0	B433*0A9108M0#0
	1200	51.6 x 75	107.8	10.4	5.5	B433*0A9128M0#0
	1500	51.6 x 96	85.8	12.7	6.7	B433*0A9158M0#0
	1800	51.6 x 96	72.6	14.0	7.4	B433*0A9188M0#0
	2200	51.6 x 130	58.3	17.4	9.2	B433*0A9228M0#0
	2700	64.3 x 96	48.4	18.7	9.9	B433*0A9278M0#0
	3300	64.3 x 115	38.5	22.3	11.8	B433*0A9338M0#0
	3900	64.3 x 130	33	25.5	13.5	B433*0A9398M0#0
	4700	64.3 x 155	26.4	30.1	15.9	B433*0A9478M0#0
	4700	76.9 x 115	26.4	28.2	14.9	B433*0C9478M0#0
	5600	64.3 x 195	23.1	36.1	19.1	B433*0A9568M0#0
	5600	76.9 x 130	23.1	32.1	17.0	B433*0C9568M0#0
	6800	76.9 x 155	18.7	38.2	20.2	B433*0A9688M0#0
	8200	91.0 x 157	15.4	44.4	23.5	B433*0A9828M0#0
	10000	91.0 x 157	13.2	49.0	25.9	B433*0A9109M0#0
	12000	91.0 x 196	9.9	58.6	31.0	B433*0A9129M0#0
	15000	91.0 x 236	9.9	70.9	37.5	B433*0A9159M0#0

Composition of ordering code

订货编码内容

- * = Mounting style
安装方式
- 2 = for capacitors with ring clip/clamp mounting
采用卡环、卡夹安装
- 4 = for capacitors with threaded stud
底部螺栓安装

- # = Insulation feature
绝缘特点
- 0 = PVC insulation
PVC绝缘
- 6 = PET insulation
PET绝缘



B43320, B43340

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 d x l mm	ESR_{typ} 120 Hz 20 °C m Ω	$I_{AC,max}$ 120 Hz 40 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码	
V DC	450	1000	51.6 x 75	128.7	9.5	5.0	B433*0A5108M0#0
	1200	51.6 x 96	107.8	11.3	6.0	B433*0A5128M0#0	
	1500	51.6 x 115	85.8	13.6	7.2	B433*0A5158M0#0	
	1800	51.6 x 130	70.4	15.7	8.3	B433*0A5188M0#0	
	2200	64.3 x 96	58.3	17.0	9.0	B433*0A5228M0#0	
	2700	64.3 x 115	48.4	20.2	10.7	B433*0A5278M0#0	
	3300	64.3 x 130	38.5	23.4	12.4	B433*0A5338M0#0	
	3900	64.3 x 155	34.1	27.4	14.5	B433*0A5398M0#0	
	3900	76.9 x 115	34.1	25.7	13.6	B433*0C5398M0#0	
	4700	64.3 x 195	26.4	33.1	17.5	B433*0A5478M0#0	
	4700	76.9 x 130	26.4	29.5	15.6	B433*0C5478M0#0	
	5600	76.9 x 155	25.3	34.6	18.3	B433*0A5568M0#0	
	6800	91.0 x 157	23.1	40.4	21.4	B433*0A5688M0#0	
	8200	91.0 x 157	18.7	44.4	23.5	B433*0A5828M0#0	
	10000	91.0 x 196	15.4	53.5	28.3	B433*0A5109M0#0	
	12000	91.0 x 236	11	63.5	33.6	B433*0A5129M0#0	

Composition of ordering code

订货编码内容

- * = Mounting style
安装方式
- 2 = for capacitors with ring clip/clamp mounting
采用卡环、卡夹安装
- 4 = for capacitors with threaded stud
底部螺栓安装

- # = Insulation feature
绝缘特点
- 0 = PVC insulation
PVC绝缘
- 6 = PET insulation
PET绝缘

Long-life grade capacitors

长寿命级电容器

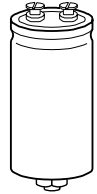
Applications

应用

- Frequency converters
变频器
- Professional power supplies
专业电源
- Uninterruptible power supplies
不间断电源
- Solar and wind power generator
太阳能和风力发电设备



B43456



B43458

Features

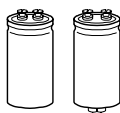
特点

- High reliability and high ripple current capability
高可靠性及高耐纹波电流能力
- All-welded constructions ensures reliable electrical contact
全焊接结构，确保可靠的电气接触性
- PAPR terminals available (Protection Against Polarity Reversal)
可选PAPR型端子（极性颠倒保护）
- Version with optimized construction for base cooling (heat sink mounting) available
可选底部散热结构优化型（散热板安装）
- Version with low-inductance design available
可选低感抗型
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge-discharge proof, polar
耐充放电，有极性
- Aluminum case with insulating sleeve
铝制外壳，带绝缘套管
- Poles with screw terminal connections
螺钉连接电极
- Mounting with ring clips, clamps or threaded stud
采用卡环/卡夹或底部螺栓安装
- The bases of types with threaded stud and $d \leq 76.9$ mm are not insulated, types with $d = 91.0$ mm have fully insulated bases
使用底部螺栓，且 $d \leq 76.9$ mm的型号底部不绝缘； $d = 91.0$ mm的型号底部完全绝缘



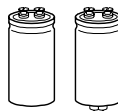
B43456, B43458

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	350 ... 500 V DC									
Surge voltage V_S 浪涌电压 V_S	$1.10 \cdot V_R$									
Operating temperaturerange 工作温度范围	-40 °C ... + 85 °C									
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	1000 ... 18000 mF									
Capacitance tolerance 电容量公差	± 20% M									
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	350 ... 450 V		500 V		Requirements: 要求 $\Delta C/C \leq \pm 15\%$ of initial value $\leq \pm 15\%$ 的初始值 $\tan \delta \leq 1.75$ times initial specified limit ≤ 1.75 倍初始规定值 $I_{leak} \leq$ initial specified limit $\leq$ 初始规定值					
	12000 h		8000 h							
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5 分钟后)	$I_{leak} \leq 0.020 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.85} + 4 \mu A$									
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	0.2									
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)		≤ 400		450	500				
	$Z(-25\text{ °C})$		3		4	3				
	$Z(+20\text{ °C})$									
	$Z(-40\text{ °C})$		7		9	10				
	$Z(+20\text{ °C})$									
Shelf life 储存寿命	After storage for 1000 h at 85 °C, the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C 高温贮存 1000 小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电 30 分钟, 恢复 24 至 48 小时后再测试。									
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz		120 Hz		300 Hz		1 kHz		10 kHz	
	350 ... 500		350 ... 500		350 ... 500		350 ... 500		350 ... 500	
	450		450		450		450		450	
	0.78	0.75	1.00	1.00	1.21	1.27	1.33	1.45	1.37	1.51
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C		+55 °C		+70 °C		+85 °C			
	350 ... 500		350 ... 500		350 ... 500		350 ... 500			
	450		450		450		450			
	2.54		2.79		2.35		2.47		1.68	
Sectional specification 分规范	IEC 60384-4									



Ripple current capability

耐波纹电流能力

Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

因为接触元件的耐纹波电流能力限制，工作电流不得超过下表的极限值：

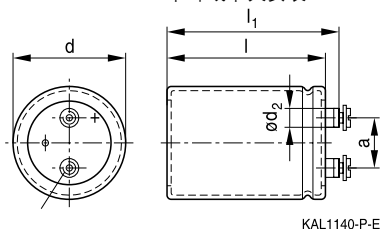
Capacitor diameter 电容直径	51.6 mm	64.3 mm	76.9 mm	91 mm
$I_{AC,max}$	34 A	45 A	57 A	80 A

Dimensional drawings

尺寸图

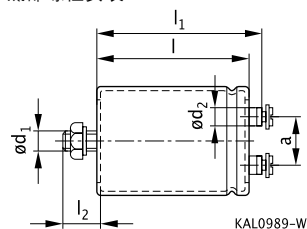
B43456

Ring clip/clamp mounting
卡环或卡夹安装



B43458

Threaded stud mounting
底部螺栓安装



M5: Min. reach of screw = 8 mm

M5: 螺纹最小深度 = 8 mm

M6: Min. reach of screw = 12 mm

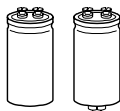
M6: 螺纹最小深度 = 12 mm

Positive pole marking: +

正极标志: +

The base of types with threaded stud and $d = 91$ mm is fully insulated (the lengths l and l_1 are increased by 0.5 mm in these cases). For types with threaded stud and $d \leq 76$ mm the base is not insulated. For non-insulated and insulated mounting instructions and accessories, refer to chapter "Screw terminals - accessories".

带底部螺栓，且 $d = 91$ mm 型号的底部完全绝缘(这些产品的高度 l 和 l_1 都增加 0.5 mm)。带底部螺栓，且 $d \leq 76$ mm 型号的底部不绝缘。关于非绝缘安装及绝缘安装说明及附件，参阅章节“螺钉式电容器 - 附件”。



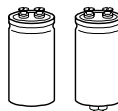
B43456, B43458

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Dimensions and weights

尺寸与重量

Terminal 端子	Dimensions (mm) with insulating sleeve 带绝缘套管的尺寸(mm)							Approx. weight (g) 约重 (克)
	d	l +3/-0	l ₁ +3/-0	l ₂ +0/- 1	d ₁	d ₂ max.	a +0.2/- 0.4	
M5	51.6 +0/- 0.8	115	121.2	17	M12	10.2	22.2	310
M5	51.6 +0/- 0.8	130	135.7	17	M12	10.2	22.2	350
M5	51.6 +0/- 0.8	80.7	87.2	17	M12	10.2	22.2	220
M5	51.6 +0/- 0.8	105.7	112.2	17	M12	10.2	22.2	280
M5	51.6 +0/- 0.8	118.2	124.7	17	M12	10.2	22.2	320
M5	51.6 +0/- 0.8	130.7	137.2	17	M12	10.2	22.2	350
M5	64.3 +0/- 0.8	96	101.7	17	M12	13.2	28.5	420
M5	64.3 +0/- 0.8	80.7	87.2	17	M12	13.2	28.5	370
M5	64.3 +0/- 0.8	96.7	103.2	17	M12	13.2	28.5	400
M5	64.3 +0/- 0.8	105.7	112.2	17	M12	13.2	28.5	440
M5	64.3 +0/- 0.8	118.2	124.7	17	M12	17.7	28.5	510
M5	64.3 +0/- 0.8	130.7	137.2	17	M12	13.2	28.5	600
M5	64.3 +0/- 0.8	143.2	149.7	17	M12	13.2	28.5	630
M5	64.3 +0/- 0.8	115	121.2	17	M12	13.2	28.5	530
M5	64.3 +0/- 0.8	130	135.7	17	M12	13.2	28.5	600
M6	76.9 +0/- 0.7	105.7	111.5	17	M12	17.7	31.7	620
M6	76.9 +0/- 0.7	118.2	124.0	17	M12	17.7	31.7	700
M6	76.9 +0/- 0.7	130.7	136.5	17	M12	17.7	31.7	800
M6	76.9 +0/- 0.7	143.2	149.0	17	M12	17.7	31.7	840
M6	76.9 +0/- 0.7	168.7	174.5	17	M12	17.7	31.7	1000
M6	76.9 +0/- 0.7	190.7	196.5	17	M12	17.7	31.7	1150
M6	76.9 +0/- 0.7	220.7	226.5	17	M12	17.7	31.7	1300
M6	76.9 +0/- 0.8	115	120.5	17	M12	17.7	31.7	680
M6	76.9 +0/- 0.8	130	135.0	17	M12	17.7	31.7	800
M6	76.9 +0/- 0.8	155	160.5	17	M12	17.7	31.7	920
M6	91.0 +0/- 2	97.0	102.3	17	M12	17.7	31.7	770
M6	91.0 +0/- 2	144.5	149.8	17	M12	17.7	31.7	1200
M6	91.0 +0/- 2	170.0	175.3	17	M12	17.7	31.7	1400
M6	91.0 +0/- 2	191.0	196.3	17	M12	17.7	31.7	1650
M6	91.0 +0/- 2	221.0	226.3	17	M12	17.7	31.7	1900
M6	91.0 +0/- 2	157	162.3	17	M12	17.7	31.7	1300
M6	91.0 +0/- 2	196	200.8	17	M12	17.7	31.7	1700
M6	91.0 +0/- 2	220	224.6	17	M12	17.7	31.7	1900



Packing

包装

Capacitor diameter 电容直径	Packing units (pcs.) 包装单位(件)	Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位(件)
51.6 mm	22	76.9 mm	12
64.3 mm	15	91.0 mm	8

For ecological reasons the packing is pure cardboard.
为保护生态环境，包装仅使用纸板。

Accessories

附件

The following items are included in the delivery package, but are not fastened to the capacitors:
以下物品已包含在交货包装中，但没有固定到电容器上：

	Thread 螺纹	Toothed washers 带齿垫圈	Screws/nuts 螺钉或螺帽	Maximum torque 最大扭矩
For terminals 用于端子	M5	—	Outer hex-cross screw with spring and plain washer M5 × 10 外六角十字型螺钉及弹垫垫圈和平垫圈 M5 × 10	2.5 Nm
	M6	—	Outer hex-cross screw with spring and plain washer M6 × 12 外六角十字型螺钉及弹垫垫圈和平垫圈 M6 × 12	4.0 Nm
For mounting ¹⁾ 用于安装 ¹⁾	M12	J 12.5 DIN 6797	Hex nut BM 12 DIN 439 六角螺帽 BM 12 DIN 439	10 Nm

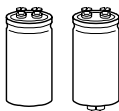
The following items must be ordered separately. For details, refer to chapter "Capacitors with screw terminals - accessories".

以下物品需要另外购买。详情参阅章节“螺钉式电容器 - 附件”。

Item 物品	Type 型号
Ring clips 卡环	B44030
Clamps for capacitors with $d \geq 64.3$ mm 电容器用卡夹 $d \geq 64.3$ mm	B44030
Insulating parts 绝缘部件	B44020

¹⁾ with different mounting method, this item is not always required. it will be delivered upon customer request accordingly.

由于安装方式不同，该配件不一定都适用。仅当客户提出需求时，EPCOS将配送该部件。



B43456, B43458

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

U_R	C_R	Case dimensions	ESR_{typ}	$I_{AC,max}$	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 20 °C m Ω	120 Hz 40 °C A	120 Hz 85 °C A	订货编码
350	1500	51.6 x 80.7	43	17	5.9	B4345*A4158M0##
	2200	51.6 x 105.7	26	22	7.9	B4345*A4228M0##
	3300	51.6 x 118.2	18	29	10.4	B4345*A4338M0##
	3900	64.3 x 105.7	16	33	12.5	B4345*A4398M0##
	4700	64.3 x 105.7	14	37	13.5	B4345*A4478M0##
	5600	76.9 x 105.7	13	45	15.6	B4345*A4568M0##
	6800	76.9 x 118.2	11	49	17.7	B4345*A4688M0##
	8200	76.9 x 143.2	10	57	21	B4345*A4828M0##
	10000	76.9 x 143.2	6	57	24	B4345*A4109M0##
	12000	91.0 x 144.5	6	80	29	B4345*A4129M0##
	15000	76.9 x 220.7	7	57	35	B4345*A4159M0##
	18000	91.0 x 221.0	5	80	40	B4345*A4189M0##
400	1000	51.6 x 80.7	55	14	4.8	B4345*A9108M0##
	1500	51.6 x 80.7	42	18	6.2	B4345*A9158M0##
	1500	51.6 x 115	73	18	6.3	B4345*K9158M000
	2200	51.6 x 105.7	28	23	8.3	B4345*A9228M0##
	2200	51.6 x 115	46	23	8.3	B4345*K9228M000
	2700	51.6 x 130.7	24	27	9.7	B4345*A9278M0##
	3300	64.3 x 96	31	31	11.0	B4345*K9338M000
	3300	64.3 x 105.7	21	32	11.4	B4345*A9338M0##
	3900	64.3 x 115	27	35	12.4	B4345*K9398M000

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

6 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

8 = for capacitors with threaded stud

底部螺栓安装

= Design

设计标识

00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter $d \geq 64.3$ mm)

低感抗电容器(13 nH) (仅限直径 $d \geq 64.3$ mm的电容器)

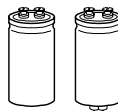
07 = for heat sink mounting (only capacitors with diameter $d \geq 64.3$ mm and without threaded stud)

散热板安装 (仅限直径 $d \geq 64.3$ mm的电容器, 无底部螺栓)

50 = for terminals with PAPR style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPR style and heat sink mounting (only $d \geq 64.3$ mm and only without threaded stud; not for low inductance)
适用于PAPR型端子与散热板安装 (仅限 $d \geq 64.3$ mm, 无底部螺栓; 不适用于低感抗型)



Technical data and ordering codes

技术参数与订货编码

U_R	C_R	Case dimensions	ESR_{typ}	$I_{AC,max}$	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 20 °C m Ω	120 Hz 40 °C A	120 Hz 85 °C A	订货编码
400	4700	64.3 x 130	22	40	14.4	B4345*L9478M000
	4700	64.3 x 130.7	15	40	14.6	B4345*B9478M0##
	4700	76.9 x 105.7	15	42	14.6	B4345*A9478M0##
	4700	76.9 x 115	22	40	14.4	B4345*K9478M000
	5600	76.9 x 115	19	46	16.3	B4345*K9568M000
	5600	76.9 x 118.2	13	46	16.6	B4345*A9568M0##
	6800	76.9 x 130	16	53	18.9	B4345*K9688M000
	6800	76.9 x 143.2	10	55	20	B4345*A9688M0##
	8200	76.9 x 155	14	57	22	B4345*K9828M000
	8200	76.9 x 168.7	9	57	22	B4345*A9828M0##
	10000	76.9 x 190.7	6	57	26	B4345*B9109M0##
	10000	91.0 x 157	10	71	25	B4345*K9109M000
	10000	91.0 x 144.5	6	74	26	B4345*A9109M0##
	12000	76.9 x 220.7	7	57	32	B4345*A9129M0##
	12000	91.0 x 157	8	80	29	B4345*K9129M000
	15000	91.0 x 196	7	80	35	B4345*K9159M000
	15000	91.0 x 221.0	7	80	36	B4345*A9159M0##
450	1000	51.6 x 80.7	111	14	5.0	B4345*A5108M0##
	1500	51.6 x 105.7	74	19	6.8	B4345*A5158M0##
	1500	51.6 x 115	74	18	6.5	B4345*K5158M000
	2200	51.6 x 115	46	24	8.5	B4345*K5228M000
	2200	64.3 x 105.7	46	25	8.7	B4345*A5228M0##
	2700	64.3 x 105.7	39	27	9.8	B4345*A5278M0##
	3300	64.3 x 115	32	32	11.3	B4345*K5338M000
	3300	76.9 x 105.7	32	33	12.5	B4345*A5338M0##

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

6 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

8 = for capacitors with threaded stud

底部螺栓安装

= Design

设计标识

00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter $d \geq 64.3$ mm)

低感抗电容器 (仅限直径 $d \geq 64.3$ mm 的电容器)

07 = for heat sink mounting (only capacitors with diameter $d \geq 64.3$ mm and without threaded stud)

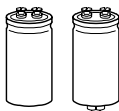
散热板安装 (仅限直径 $d \geq 64.3$ mm 的电容器, 无底部螺栓)

50 = for terminals with PAPR style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPR style and heat sink mounting (only $d \geq 64.3$ mm and only without threaded stud; not for low inductance)

适用于PAPR型端子与散热板安装 (仅限 $d \geq 64.3$ mm, 无底部螺栓; 不适用于低感抗型)



B43456, B43458

Long life industrial – 85 °C 长寿命工业型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C m Ω	$I_{AC,max}$ 120 Hz 40 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
450	3900	64.3 x 130	28	36	12.8	B4345*K5398M000
	4700	64.3 x 143.2	23	42	14.6	B4345*A5478M0##
	4700	76.9 x 115	23	42	14.9	B4345*K5478M000
	4700	76.9 x 118.2	23	42	15.6	B4345*B5478M0##
	5600	76.9 x 130	21	47	16.6	B4345*K5568M000
	5600	76.9 x 143.2	21	51	17.7	B4345*A5568M0##
	6800	76.9 x 155	16	57	20	B4345*K5688M000
	6800	76.9 x 168.7	17	56	20	B4345*B5688M0##
	6800	91.0 x 144.5	16	59	21	B4345*A5688M0##
	8200	76.9 x 220.7	14	57	25	B4345*A5828M0##
	8200	91.0 x 157	14	65	23	B4345*K5828M000
	10000	76.9 x 220.7	12	57	28	B4345*A5109M0##
	10000	91.0 x 170.0	11	77	27	B4345*B5109M0##
	10000	91.0 x 196	12	76	27	B4345*K5109M000
	12000	91.0 x 221.0	8	80	33	B4345*A5129M0##
	12000	91.0 x 220	8	80	31	B4345*K5129M000
500	2700	64.3 x 143.2	35	28	10.0	B4345*A6278M0##
	2700	76.9 x 105.7	35	28	9.9	B4345*B6278M0##
	3300	76.9 x 130.7	32	30	10.8	B4345*A6338M0##
	3900	76.9 x 143.2	26	35	12.7	B4345*A6398M0##
	4700	76.9 x 168.7	23	40	14.1	B4345*A6478M0##
	4700	91.0 x 144.5	22	41	14.5	B4345*B6478M0##

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

6 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

8 = for capacitors with threaded stud

底部螺栓安装

= Design

设计标识

00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter $d \geq 64.3$ mm)

低感抗电容器(13 nH) (仅限直径 $d \geq 64.3$ mm的电容器)

07 = for heat sink mounting (only capacitors with diameter $d \geq 64.3$ mm and without threaded stud)

散热板安装 (仅限直径 $d \geq 64.3$ mm的电容器, 无底部螺栓)

50 = for terminals with PAPER style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPER style and heat sink mounting (only $d \geq 64.3$ mm and only without threaded stud; not for low inductance)

适用于PAPR型端子与散热板安装 (仅限 $d \geq 64.3$ mm, 无底部螺栓; 不适用于低感抗型)

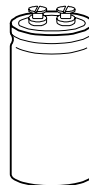
Long-life grade capacitors

长寿命级电容器

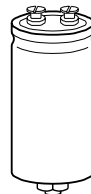
Applications

应用

- Frequency converters
变频器
- Traction
机车牵引装置
- Professional power supplies
专业电源



B43740



B43760

Features

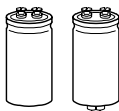
特点

- Outstanding reliability
卓越的可靠性
- Good thermal characteristics and high ripple current capability
优异的导热能力与高耐纹波电流能力
- Extra long useful life
超长使用寿命
- Wide temperature range
工作温度范围宽
- All-welded constructions ensures reliable electrical contact
全焊接结构，确保可靠的电气接触性
- PAPER terminals available (Protection Against Polarity Reversal)
可选PAPER型端子（极性颠倒保护）
- Version with optimized construction for base cooling (heat sink mounting) available
可选底部散热结构优化型（散热板安装）
- Version with low-inductance design available
可选低感抗型
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge-discharge proof, polar
耐充放电，有极性
- Aluminum case with insulating sleeve
铝制外壳，带绝缘套管
- Poles with screw terminal connections
螺钉连接电极
- Mounting with ring clips, clamps or threaded stud
采用卡环 / 卡夹或底部螺栓安装
- The bases of types with threaded stud and $d \leq 76.9$ mm are not insulated, types with $d = 91.0$ mm have fully insulated bases
使用底部螺栓，且 $d \leq 76.9$ mm 的型号底部不绝缘； $d = 91.0$ mm 的型号底部完全绝缘



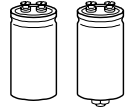
B43740, B43760

Extra long useful life – 105 °C 超长使用寿命型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	350 ... 450 V DC					
Surge voltage V_S 浪涌电压 V_S	1.10 · V_R (105 °C: $V_R \leq 400$ V DC; 85 °C: $V_R = 450$ V DC;)					
Operating temperature range 工作温度范围	-40 °C ... + 105 °C					
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	1000 ... 18000 mF					
Capacitance tolerance 电容量公差	± 20% M					
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	6000 h		Requirements: 要求 $\Delta C/C \leq \pm 15\%$ of initial value $\leq \pm 15\%$ 的初始值 $\tan \delta \leq 1.75$ times initial specified limit ≤ 1.75 倍初始规定值 $I_{leak} \leq$ initial specified limit $\leq$ 初始规定值			
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.018 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.85} + 4 \mu A$					
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	0.2					
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (100 Hz)	$Z(-25\text{ °C})$ $Z(+20\text{ °C})$	4				
	$Z(-40\text{ °C})$ $Z(+20\text{ °C})$	10				
Shelf life 储存寿命	After storage for 1000 h at 85 °C,the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。					
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz	
	0.78	1.00	1.24	1.34	1.38	
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C		+70 °C	+90 °C	+105 °C
	3.10	3.00		2.78	2.14	1.00
Sectional specification 分规范	IEC 60384-4					

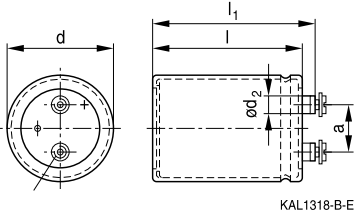


Dimensional drawings

尺寸图

B43740:

Ring clip/clamp mounting
卡环或卡夹安装



M5: Min. reach of screw = 9.5 mm

M5: 螺纹最小深度= 9.5 mm

9 mm for low inductance design

低感抗设计= 9 mm

M6: Min. reach of screw = 12 mm

M6: 螺纹最小深度= 12 mm

9.5 mm for low inductance design

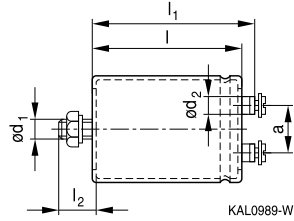
低感抗设计= 9.5 mm

Positive pole marking: +

正极标志: +

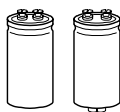
B43760:

Threaded stud mounting
底部螺栓安装



The base of types with threaded stud and $d = 91$ mm is fully insulated (the lengths l and l_1 are increased by 0.5 mm in these cases). For types with threaded stud and $d \leq 76$ mm the base is not insulated. Also refer to the mounting instructions in chapter "Capacitors with Screw terminals - accessories".

带底部螺栓且 $d = 91$ mm 的电容器，其底部完全绝缘(这些产品的高度 l 和 l_1 都增加 0.5 mm)。底部螺栓且 $d \leq 76$ mm 型号的底部不绝缘。安装说明参阅章节“螺钉式电容器-附件”。



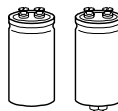
B43740, B43760

Extra long useful life – 105 °C 超长使用寿命型 – 105 °C

Dimensions and weights

尺寸与重量

Terminal 端子	Dimensions (mm) with insulating sleeve 带绝缘套管的尺寸(mm)							Approx. weight (g) 约计重量(克)
	d	l ±1	l ₁ ±1	l ₂ +0/-1	d ₁	d ₂ max.	a +0.2/-0.4	
M5	51.6 +0/-0.8	80.7	87.2	17	M12	10.2	22.2	220
M5	51.6 +0/-0.8	105.7	112.2	17	M12	10.2	22.2	280
M5	51.6 +0/-0.8	118.2	124.7	17	M12	10.2	22.2	320
M5	51.6 +0/-0.8	130.7	137.2	17	M12	10.2	22.2	350
M5	64.3 +0/-0.8	80.7	87.2	17	M12	13.2	28.5	370
M5	64.3 +0/-0.8	105.7	112.2	17	M12	13.2	28.5	440
M5	64.3 +0/-0.8	118.2	124.7	17	M12	13.2	28.5	510
M5	64.3 +0/-0.8	130.7	137.2	17	M12	13.2	28.5	600
M5	64.3 +0/-0.8	143.2	149.7	17	M12	13.2	28.5	630
M6	76.9 +0/-0.7	105.7	111.5	17	M12	17.7	31.7	620
M6	76.9 +0/-0.7	118.2	124.0	17	M12	17.7	31.7	700
M6	76.9 +0/-0.7	130.7	136.5	17	M12	17.7	31.7	800
M6	76.9 +0/-0.7	143.2	149.0	17	M12	17.7	31.7	840
M6	76.9 +0/-0.7	168.7	174.5	17	M12	17.7	31.7	1000
M6	76.9 +0/-0.7	190.7	196.5	17	M12	17.7	31.7	1150
M6	76.9 +0/-0.7	220.7	226.5	17	M12	17.7	31.7	1300
M6	91.0 +0/-2	144.5	149.8	17	M12	17.7	31.7	1200
M6	91.0 +0/-2	170.0	175.3	17	M12	17.7	31.7	1400
M6	91.0 +0/-2	191.0	196.3	17	M12	17.7	31.7	1650
M6	91.0 +0/-2	221.0	226.3	17	M12	17.7	31.7	1900



Packing

包装

Capacitor diameter 电容直径	Packing units (pcs.) 包装单位(件)
51.6 mm	22
64.3 mm	15

Capacitor diameter 电容器直径	Packing units (pcs.) 包装单位(件)
76.9 mm	12
91.0 mm	8

For ecological reasons the packing is pure cardboard.
为保护生态环境，包装仅使用纸板。

Accessories

附件

The following items are included in the delivery package, but are not fastened to the capacitors:
以下物品已包含在交货包装中，但没有固定到电容器上：

	Thread 螺纹	Toothed washers 带齿垫圈	Screws/nuts 螺钉或螺帽	Maximum torque 最大扭矩
For terminals 用于端子	M5	—	Outer hex-cross screw with spring and plain washer M5 × 10 外六角十字型螺钉及弹垫垫圈和平垫圈 M5 × 10	2.5 Nm
	M6	—	Outer hex-cross screw with spring and plain washer M6 × 12 外六角十字型螺钉及弹垫垫圈和平垫圈 M6 × 12	4.0 Nm
For mounting ¹⁾ 用于安装 ¹⁾	M12	J 12.5 DIN 6797	Hex nut BM 12 DIN 439 六角螺帽 BM 12 DIN 439	10 Nm

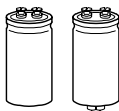
The following items must be ordered separately. For details, refer to chapter "Capacitors with screw terminals - accessories".

以下物品需要另外购买。详情参阅章节“螺钉式电容器 - 附件”。

Item 物品	Type 型号
Ring clips 卡环	B44030
Clamps for capacitors with $d \geq 64.3$ mm 电容器用卡夹 $d \geq 64.3$ mm	B44030
Insulating parts 绝缘部件	B44020

¹⁾ with different mounting method, this item is not always required. it will be delivered upon customer request accordingly.

由于安装方式不同，该配件不一定都适用。仅当客户提出需求时，EPCOS将配送该部件。



B43740, B43760

Extra long useful life – 105 °C 超长使用寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

U _R	C _R	Case dimensions	ESR _{typ}	I _{AC,max}	I _{AC,R}	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 d × l mm	120 Hz 20 °C mΩ	120 Hz 40 °C A	120 Hz 105 °C A	订货编码
350	1000	51.6 × 80.7	92	13	4.3	B437*0A4108M0##
	1500	51.6 × 80.7	65	17	5.4	B437*0A4228M0##
	2200	51.6 × 105.7	43	22	7.3	B437*0A4228M0##
	2700	64.3 × 80.7	36	25	8.2	B437*0A4278M0##
	3300	64.3 × 105.7	31	29	9.4	B437*0A4338M0##
	3900	64.3 × 118.2	27	32	10.5	B437*0A4398M0##
	4700	64.3 × 143.2	23	37	11.9	B437*0A4478M0##
	4700	76.9 × 105.7	23	37	12.0	B437*0B4478M0##
	5600	76.9 × 130.7	18	43	14.0	B437*0A4568M0##
	6800	76.9 × 143.2	16	49	15.8	B437*0A4688M0##
	8200	76.9 × 168.7	12	57	19.1	B437*0A4828M0##
	8200	91.0 × 144.5	11	62	20.2	B437*0B4828M0##
	10000	76.9 × 190.7	10	57	22.0	B437*0A4109M0##
	10000	91.0 × 144.5	10	67	21.9	B437*0B4109M0##
	12000	76.9 × 220.7	8	57	25.9	B437*0A4129M0##
	12000	91.0 × 170.0	7	80	26.9	B437*0B4129M0##
	15000	91.0 × 191.0	7	80	28.4	B437*0A4159M0##
	18000	91.0 × 221.0	6	80	32.0	B437*0A4189M0##

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

4 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

6 = for capacitors with threaded stud

底部螺栓安装

= Design

设计标识

00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter d ≥ 64.3 mm)

低感抗电容器(13 nH) (仅限直径d ≥ 64.3 mm的电容器)

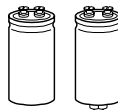
07 = for heat sink mounting (only capacitors with diameter d ≥ 64.3 mm and without threaded stud)

散热板安装 (仅限直径d ≥ 64.3 mm的电容器, 无底部螺栓)

50 = for terminals with PAPR style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPR style and heat sink mounting (only d ≥ 64.3 mm and only without threaded stud; not for low inductance)
适用于PAPR型端子与散热板安装 (仅限d ≥ 64.3 mm, 无底部螺栓; 不适用于低感抗型)



Technical data and ordering codes

技术参数与订货编码

U_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C m Ω	$I_{AC,max}$ 120 Hz 40 °C A	$I_{AC,R}$ 120 Hz 105 °C A	Ordering code 订货编码
V DC						
400	1000	51.6 x 80.7	92	14	4.5	B437*0A9108M0##
	1500	51.6 x 105.7	60	19	6.1	B437*0A9158M0##
	2200	64.3 x 105.7	42	24	7.9	B437*0A9228M0##
	2200	51.6 x 130.7	36	27	8.7	B437*0B9228M0##
	2700	64.3 x 105.7	32	29	9.3	B437*0A9278M0##
	3300	64.3 x 130.7	27	33	10.8	B437*0A9338M0##
	3300	76.9 x 105.7	27	34	11.0	B437*0B9338M0##
	3900	76.9 x 118.2	22	38	12.5	B437*0A9398M0##
	4700	76.9 x 130.7	18	44	14.3	B437*0A9478M0##
	5600	76.9 x 143.2	16	50	16.2	B437*0A9568M0##
	6800	76.9 x 168.7	14	56	18.2	B437*0A9688M0##
	6800	91.0 x 144.5	13	58	19.0	B437*0B9688M0##
	8200	76.9 x 190.7	12	57	20.8	B437*0A9828M0##
	8200	91.0 x 144.5	11	66	21.4	B437*0B9828M0##
	10000	76.9 x 220.7	9	57	25.4	B437*0A9109M0##
	10000	91.0 x 191.0	8	80	26.0	B437*0B9109M0##
	12000	91.0 x 221.0	6	80	31.1	B437*0A9129M0##

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

4 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

6 = for capacitors with threaded stud

底部螺栓安装

= Design

设计标识

00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter $d \geq 64.3$ mm)

低感抗电容器(13 nH) (仅限直径 $d \geq 64.3$ mm的电容器)

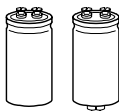
07 = for heat sink mounting (only capacitors with diameter $d \geq 64.3$ mm and without threaded stud)

散热板安装 (仅限直径 $d \geq 64.3$ mm的电容器, 无底部螺栓)

50 = for terminals with PAPR style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPR style and heat sink mounting (only $d \geq 64.3$ mm and only without threaded stud; not for low inductance)
适用于PAPR型端子与散热板安装 (仅限 $d \geq 64.3$ mm, 无底部螺栓; 不适用于低感抗型)



B43740, B43760

Extra long useful life – 105 °C 超长使用寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

U _R	C _R	Case dimensions	ESR _{typ}	I _{AC,max}	I _{AC,R}	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 d × l mm	120 Hz 20 °C mΩ	120 Hz 40 °C A	120 Hz 105 °C A	订货编码
450	1000	51.6 × 105.7	88	15	4.9	B437*0A5108M0##
	1500	51.6 × 118.2	58	20	6.5	B437*0A5158M0##
	2200	64.3 × 118.2	40	26	8.5	B437*0A5228M0##
	2700	64.3 × 130.7	31	31	10.2	B437*0A5278M0##
	3300	76.9 × 130.7	25	37	11.9	B437*0A5338M0##
	3300	64.3 × 143.2	25	36	11.9	B437*0B5338M0##
	3900	76.9 × 143.2	21	41	13.4	B437*0A5398M0##
	4700	76.9 × 168.7	18	47	15.3	B437*0A5478M0##
	5600	76.9 × 190.7	16	54	17.5	B437*0A5568M0##
	5600	91.0 × 144.5	15	55	18.0	B437*0B5568M0##
	6800	76.9 × 220.7	13	57	20.5	B437*0A5688M0##
	6800	91.0 × 170.0	12	64	20.9	B437*0B5688M0##
	8200	91.0 × 191.0	9	77	25.0	B437*0A5828M0##
	10000	91.0 × 221.0	7	80	29.7	B437*0A5109M0##

Composition of ordering code

订货编码的编码规则

* = Mounting style

安装方式

4 = for capacitors with ring clip/clamp mounting

采用卡环、卡夹安装

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00 = for capacitors with standard inductance

标准感抗电容器

03 = for capacitors with low inductance (13 nH) (only capacitors with diameter d ≥ 64.3 mm)

低感抗电容器(13 nH) (仅限直径d ≥ 64.3 mm的电容器)

07 = for heat sink mounting (only capacitors with diameter d ≥ 64.3 mm and without threaded stud)

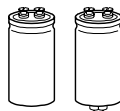
散热板安装 (仅限直径d ≥ 64.3 mm的电容器, 无底部螺栓)

50 = for terminals with PAPR style (not for low-inductance)

PAPR型端子 (不适用于低感抗型)

57 = for terminals with PAPR style and heat sink mounting (only d ≥ 64.3 mm and only without threaded stud; not for low inductance)

适用于PAPR型端子与散热板安装 (仅限d ≥ 64.3 mm, 无底部螺栓; 不适用于低感抗型)



Special designs for B43456/B43458, B43740/B43760

特殊设计, 仅针对B43456/B43458, B43740/B43760系列

■ Low-inductance design

低感抗设计

■ PAPR terminal style

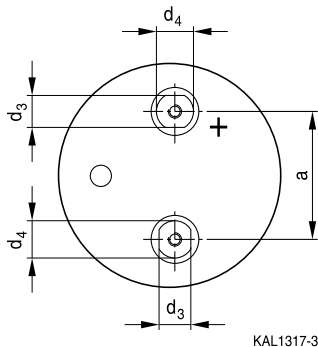
PAPR 端子型号

With our PAPR terminal style (Protection Against Polarity Reversal) we offer an optional mechanical feature in addition to the visual polarity marking on the cover disk and the sleeve, which prevents from mounting in reverse polarity. The non-circular shape of the terminals and their arrangement perpendicular to each other enables the user to definitely prevent wrong mounting with respect to polarity (Poka Yoke).

除了在盖板与套管上提供可视极性标志外, 我们的PAPR 端子型号(极性颠倒保护)具有可供选择的机械特征。它能防止安装时的极性颠倒。非环形结构的端子彼此成直角, 这就彻底避免了用户装反极性(防差错措施)。

Dimensional drawing of PAPR terminal configuration

PAPR 端子配置尺寸图

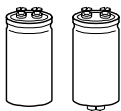


KAL1317-3

Dimensions for PAPR terminal style (mm)

PAPR 型端子尺寸 (mm)

Can diameter 铝壳直径	Terminal 端子	$d_3 \pm 0.1$	$d_4 \pm 0.1$	$a + 0.2/ -0.4$	Min. reach of screw 螺纹最小深度	
					Standard design 标准设计 #050	For heat sink mounting 散热板安装 #057
51.6	M5	10	13	22.2	9.5	—
64.3	M5	13	15	28.5	9.5	7.3
76.9	M6	13	15	31.7	12.0	9.7
91.0	M6	13	15	31.7	12.0	9.7



Special design specifications

特殊设计说明

All other dimensions of the capacitor such as diameter d , case length l and overall length l_1 are identical with those of standard capacitors of this series. Please refer to the tables "Dimensions and weights" (standard types) and "Dimensions and weights for heat sink mounting" (special designs).

电容器所有其它尺寸，如直径 d ，外壳长度 l 与总长度 l_1 与本系列标准电容器一致。请参阅表格“尺寸与重量”（标准型号）与“散热板安装型的尺寸与重量”（特殊设计）。

■ For heat sink mounting

散热板安装

Design for optimal connection of capacitors to the heat sink when using base cooling with the following features:

- Electrical insulation of the capacitors base with 2 overlapping thermal pads for optimal heat flow (minimal thermal resistance at the capacitor base)

采用底部散热方式时，电容器与散热板之间的最佳连接方式的设计具有有如下特点：

电气绝缘的电容器底部配备两层散热垫促进最佳的热传导（电容底部热阻最小）

- Minimal overall length tolerance (± 0.35 mm) for mounting between heat sink and bus bar

散热板与母线安装的最小总长度允差为(± 0.35 mm)

- Case with extra groove near the base for clamp mounting (recommended ring clamp B44030A0165B ... A0190B)

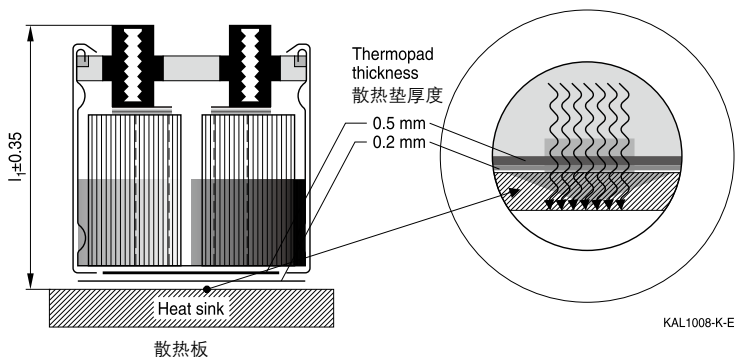
外壳靠近底部有附加沟槽，用卡夹安装（推荐卡夹B44030A0165B...A0190B）

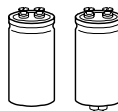
This version is available only for capacitors without threaded stud and for diameters ≥ 64.3 mm.

此型号仅用于不带底部螺栓，且直径 ≥ 64.3 mm 的电容器。

Regarding ripple current and useful life, please refer to column $I_{AC,R}$ in the table "Technical data and ordering codes".

关于纹波电流与使用寿命，请参阅“技术参数与订货编码”表格中的中 $I_{AC,R}$ 列。





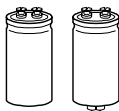
Dimensions and weights for heat sink mounting:
散热板安装型的尺寸与重量

Terminal 端子	Dimension s (mm) with insulating sleeve 带绝缘套管的尺寸 (mm)					Min. reach of screw 螺纹最小 深度 mm	Approx. weight 约计重量 g
	d	$l \pm 1$	$l_1 \pm 0.35$	$d_2 \text{ max.}$	$a +0.2/ -0.4$		
M5	64.3 +0/-0.8	80.7	86.3	13.2	28.5	7.3	370
M5	64.3 +0/-0.8	105.7	111.3	13.2	28.5	7.3	440
M6	76.9 +0/-0.7	105.7	110.6	17.7	31.7	9.7	620
M6	76.9 +0/-0.7	143.2	148.1	17.7	31.7	9.7	840
M6	91.0 +0/-2	97.0	101.4	17.7	31.7	9.7	1000
M6	91.0 +0/-2	144.5	148.9	17.7	31.7	9.7	1200

Dimensions for other sizes are available upon request.
其它尺寸可按要求定制。

Ordering codes:
订货编码:

Design 设计	Identification in third block of ordering code 与订购码第三区一致	Remark 备注
Low inductance (13 nH) 低感抗 (13 nH)	M003	For capacitors with diameter $d \geq 64.3 \text{ mm}$ 直径 $d \geq 64.3 \text{ mm}$ 的电容器
For heat sink mounting 散热板安装	M007	For capacitors with diameter $d \geq 64.3 \text{ mm}$ and without threaded stud 直径 $d \geq 64.3 \text{ mm}$ 不带底部螺栓的电容器
PAPR terminal style PAPR端子型	M050	For capacitors with diameter $d \geq 51.6 \text{ mm}$ 直径 $d \geq 51.6 \text{ mm}$ 的电容器
PAPR terminal style and heat sink mounting PAPR端子型和散热板 安装	M057	For capacitors with diameter $d \geq 64.3 \text{ mm}$ and without threaded stud 直径 $d \geq 64.3 \text{ mm}$ 不带底部螺栓的电容器



Special design specifications

特殊设计说明

Accessories

附件

The following items are included in the delivery package, but are not fastened to the capacitors:

以下物品包含在交货包装中，但没有固定到电容器上：

	Thread 螺纹	Toothed washers 带齿垫圈	Screws/nuts 螺钉或螺帽	Maximum torque 最大扭矩
For terminals 用于端子	M5	A 5.1 DIN 6797	Cylinder-head screw M5 × 8 DIN 84-4.8 汽缸盖螺钉M5 × 8DIN84-4.8	2 Nm
	M6	A 6.4 DIN 6797	Cylinder-head screw M6 × 12 DIN 85-4.8 汽缸盖螺钉M6 × 12 DIN 85-4.8	2.5 Nm
For mounting ¹⁾ 用于安装 ¹⁾	M12	J 12.5 DIN 6797	Hex nut BM 12 DIN 439 六角螺帽BM12DIN439	10 Nm

The following items must be ordered separately. For details, refer to chapter "Capacitors with screw terminals - accessories".

以下物品需要另外购买。详情参阅章节“螺钉式电容器 - 附件”。

Item 物品	Type 型号
Ring clips 卡环	B44030
Clamps for capacitors with $d \geq 64.3$ mm 电容器用卡夹， $d \geq 64.3$ mm	B44030
Insulating parts 绝缘部件	B44020

¹⁾ with different mounting method, this item is not always required. it will be delivered upon customer request accordingly.

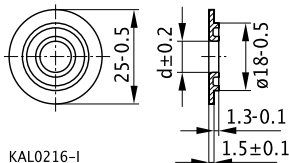
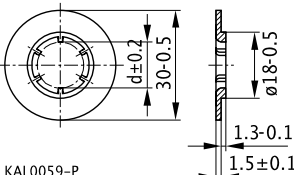
由于安装方式不同，该配件不一定都适用。仅当客户提出需求时，EPCOS将配送该部件。

Accessories for capacitors with mounting stud on capacitor base

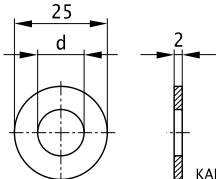
螺钉电容器 - 附件

Capacitor diameter 电容器直径	Thread size 螺纹尺寸	Dimensional drawing 尺寸图	Diameter 直径 mm	Ordering code 订货编码
-----------------------------	---------------------	----------------------------	----------------------	-----------------------

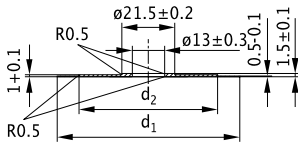
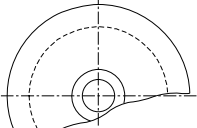
Insulating plastic shoulder washer "P" similar to DIN 41331 specifications
P型绝缘塑料垫圈与DIN 41331规范一致

≤ 40 mm	M8	 KAL0216-I	8.4	B44020B0001B025
> 40 mm	M12	 KAL0059-P	12.5	B44020B0002B030

Insulating washer "N" made of laminated paper
N型层压纸材质绝缘垫圈

≤ 40 mm	M8	 KAL0066-7	8.4	B44020A0001B025
> 40 mm	M12		13	B44020A0002B025

Insulating washer made of Hostalen
聚丙烯纤维材质绝缘垫圈

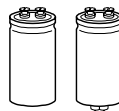
51.6 mm		 KAL0061-1	$d_1 - 0.5 = 51$ $d_2 - 0.5 = 31$	B44020B0006B051
76.9 mm		 KAL0061-1	$d_1 - 0.5 = 76$ $d_2 - 0.5 = 56$	B44020B0006B076

Screw terminals – accessories 螺钉电容器 - 附件

Plastic cap nut "V"
V型塑料螺帽

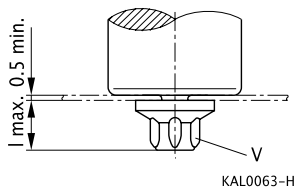
Reinforced nylon cap nut
增强型尼龙螺帽

Please read *Important notes* on page 2 and *Cautions and warnings* on page 8.
请参阅第2页 *重要说明* 与第8页 *注意和警告* 内容。

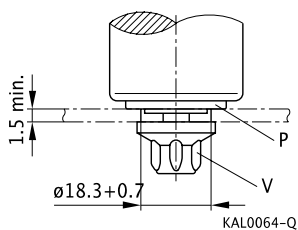


Mounting instructions

安装说明



Non-insulated mounting with cap nut
非绝缘安装用螺帽



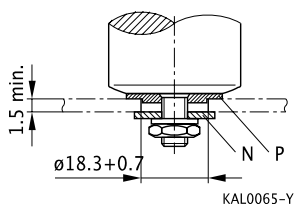
Insulated mounting with cap nut
绝缘安装用螺帽

Mounting hole diameter
安装孔直径

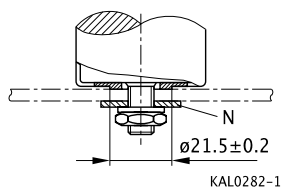
Insulated mounting with DIN 439 hex nut
DIN439六角螺母的绝缘安装

$d \leq 76.9 \text{ mm}$

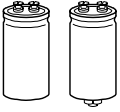
$d = 91 \text{ mm}$



Mounting hole diameter
安装孔直径



Mounting hole diameter
安装孔直径



B44020

Screw terminals – accessories 螺钉电容器 - 附件

Plastic washer and cap nut mounting

塑料螺帽和垫圈安装

Screw-terminal capacitors with thread stud can be mounted with plastic washer and cap nut for insulation considerations.

从绝缘方面考虑，底部带螺栓的螺钉式电容器可选用塑料螺帽和垫圈安装。

Given different mounting situations, e.g., thickness of mounting plate, combinations of specific washer and cap nut, these factors will have an effect on the mounting length and resultingly on maximum torque of cap nut. Here, the following maximum torque of plastic cap nut was recommended,

由于安装条件不同，比如，不同的安装板厚度，不同的垫圈和螺帽组合等，这些因素将导致螺帽和螺栓之间的配合深度不同，从而导致不同的螺帽最大安装扭矩。因此，我们推荐如下的最大安装扭矩：

Maximum torque is 5Nm in case of 10 mm mounting thread length

安装螺纹配合深度为10 mm时，最大安装扭矩值为5Nm；

Maximum torque is 7 Nm in case of 13 mm mounting thread length

安装螺纹配合深度为13 mm时，最大安装扭矩值为7 Nm；

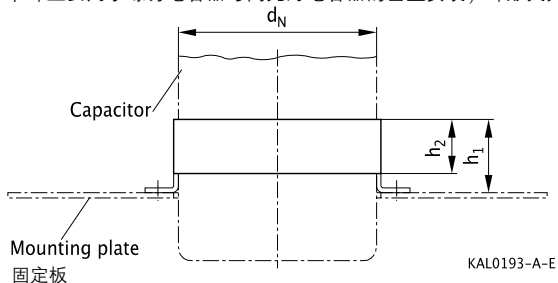
Ring clip mounting

卡环安装

Ring clips are primarily used for upright mounting of screw-terminal and photoflash capacitors.

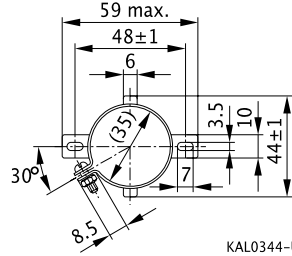
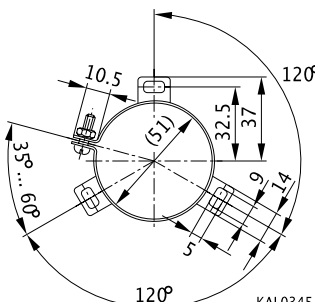
The ring clips are corrosion protected and are RoHS-compatible.

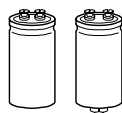
卡环主要用于螺钉电容器与闪光灯电容器的垂直安装，环形夹具有耐腐蚀性且为环保产品。



It is recommended to insert an additional insulating strip between capacitor and ring clip to avoid any risk of damage due to edges from the clip. The strip is included in delivery. For ordering code, see the following table. Attention must be paid to any relevant regulations (e.g. VDE, BSA or UL).

建议在电容器与卡环之间插入额外的绝缘带，避免卡环边缘造成的损坏。交货时已含绝缘带。订货编码见下表。必须注意相关规定(例如，VDE, BSA or UL)。

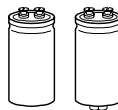
d_N	h_1 mm	h_2	Ring clip version 卡环种类	Ordering code with insulating strip 订货编码附绝缘带
35	15	10	 KAL0344-U	B44030J0036B000 (insulating strip length: 230 mm) (绝缘带长度: 230 mm)
50	22	15	 KAL0345-3	B44030J0051B000 (insulating strip length: 325 mm) (绝缘带长度: 230 mm)



B44030

Screw terminals – accessories 螺钉电容器-附件

d_N	h_1 mm	h_2	Ring clip version 卡环的种类	Ordering code 订货编码 with insulating strip 附绝缘带
65	29	19	KAL0346-B	B44030J0064B000 (insulating strip length: 420 mm 绝缘带长度: 420 mm)
75	29	19	KAL0347-J	B44030J0075B000 (insulating strip length: 495 mm 绝缘带长度: 495 mm)
90	29	19	KAL0289-N	B44030J0090B000 (insulating strip length: 585 mm 绝缘带长度: 585 mm)



Clamp mounting

卡夹安装

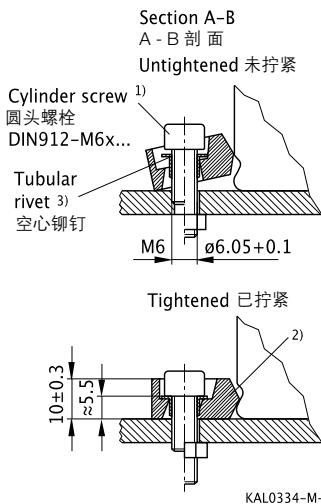
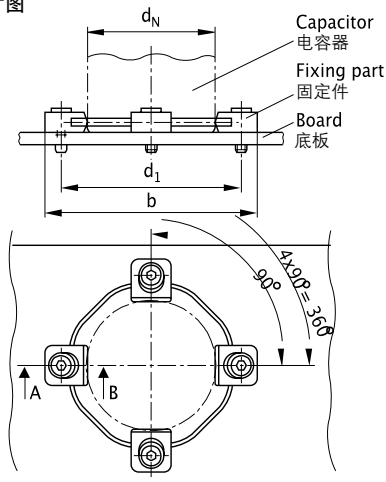
Screw-terminal capacitors without threaded stud and with a diameter ≥ 64.3 mm can also be mounted with ring clamps. Clamp mounting offers the following advantages:

不带底部螺栓, 且直径 ≥ 64.3 mm 的螺钉电容器也可用卡夹安装。卡夹安装具有以下优点:

- Optimum heat transfer between capacitor base and board due to pressure contact
由于电容器底部和安装板之间存在接触压力, 二者之间的热传递得到了最大化
- High vibration resistance
强抗振能力
- Electrically insulated material
电气绝缘材料

Dimensional drawing

尺寸图



1) Length depends on application.
长度取决于用途。

2) The screws have to be tightened uniformly and crosswise until the fixing part rests flatly on the board.
螺母应该均匀用力且交叉拧紧, 直到固定件紧密贴在底板上。

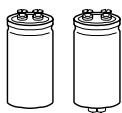
3) Tubular rivets included in delivery package.
交货包装包含空心铆钉。

Dimensions and ordering codes

尺寸与订购码

Capacitor diameter 电容器直径 d_N	$d_1 \pm 0.2$ mm	b mm	Ordering code 订货编码
65 mm	87	104	B44030A0165B000
75 mm	99	116	B44030A0175B000
90 mm	112	130	B44030A0190B000

Screws are not included in the delivery package.
交货包装不包含螺母。



B44030

Screw terminals – accessories 螺钉电容器-附件

Mounting set (ring clamps)

安装套件 (卡夹)

- Protects the capacitor against tilt and the terminals from mechanical stress
避免电容器歪斜以及避免端子受到机械应力
- Fits for different capacitor length
适用于不同电容器高度
- Electrically insulated clamping material
电气绝缘的夹持材料

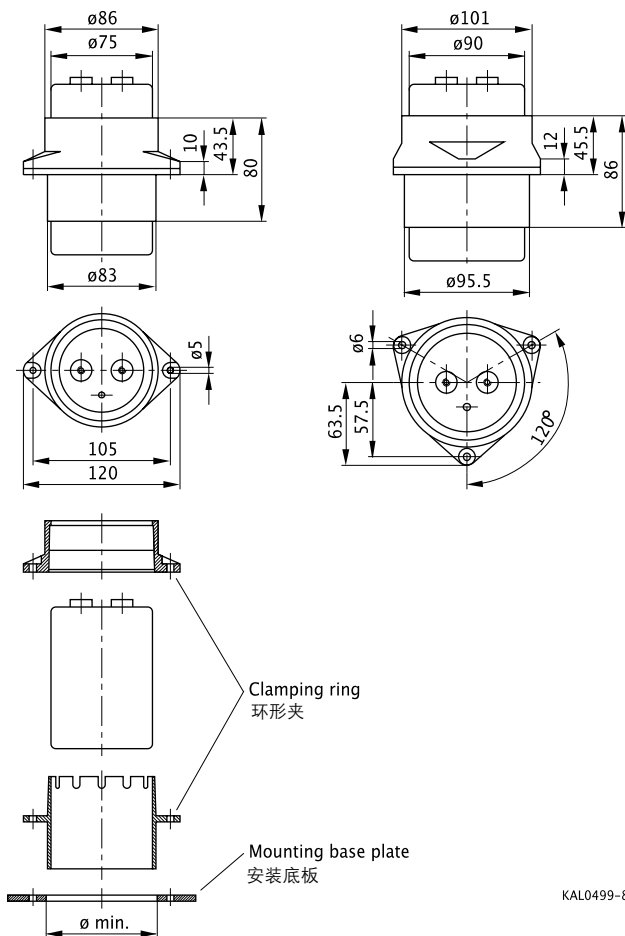
Dimensions and ordering codes

尺寸与订货编码

Capacitor diameter 电容直径 d_N	$\varnothing_{\min}$	Ordering code 订货编码
75 mm	84 mm	B44030A0375B000
90 mm	96.5 mm	B44030A0390B000

Dimensional drawing

尺寸图



KAL0499-8



Page
页码

Snap-in capacitors
焊片式电容器

Selection chart 选型图	106
Snap-in capacitors 焊片式电容器	107
Packing information 包装信息	207

Snap-in capacitors 焊片式电容器

Selection chart 选型图

85 °C

Standard 标准型

B41231 / B43231	
10 ... 450 V DC	
85 °C / > 2000 h	
Page 107	107 页

Long life 长寿命型

B43232	
200... 450 V DC	
85 °C / > 3000 h	
Page 125	125 页

*Long useful life
长使用寿命型*

B43501	
400... 450 V	
85 °C / > 10000 h	
105 °C at $V_{OP} \leq 0.93 \cdot V_R$	
Page 133	133 页

105 °C

Standard 标准型

B41252 / B43252	
10 ... 500 V DC	
105 °C / > 2000 h	
Page 151	151 页

Long life 长寿命型

B43254	
160 ... 450 V DC	
105 °C / > 3000 h	
Page 169	169 页

Long life 长寿命型

B43255	
200 ... 450 V DC	
105 °C / > 5000 h	
Page 181	181 页

*compact / High ripple current
小型化 / 耐高纹波电流型*

B43256	
160 ... 450 V DC	
105 °C / > 3000 h	
Page 189	189 页

Compact 小型化

B43510	
385...450 V DC	
85 °C / > 5000 h	
Pag 139	139 页

Ultra compact 超小型化

B43508	
200 ... 450 V DC	
105 °C / > 3000 h	
Page 199	199 页

*Outstanding ripple current
纹波电流优良型*

B43511	
350 ... 450 V	
85 °C / > 12000 h	
Page 145	145 页

General-purpose grade capacitors

通用级电容器

Applications

应用

- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源

Features

特点

- High ripple current capability
耐高纹波电流能力
- RoHS-compatible
符合RoHS要求



Construction

结构

- Aluminum case, fully insulated
铝质外壳，整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管上标注负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B41231, B43231

Standard series – 85 °C 标准型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

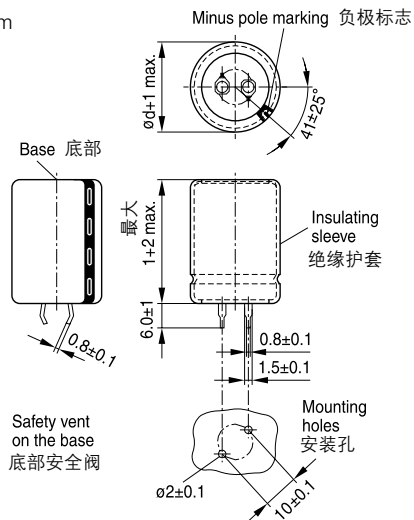
Rated voltage V_R 额定电压 V_R	10 ... 450 V DC									
Surge voltage V_S 浪涌电压 V_S	$1.15 \cdot V_R$ (for $V_R \leq 315$ V DC) $1.10 \cdot V_R$ (for $V_R > 315$ V DC)									
Operating temperature range 工作温度范围	$V_R \leq 250$ V DC: -40 °C ... $+85$ °C $V_R \geq 315$ V DC: -25 °C ... $+85$ °C									
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	56 ... 68000 μ F									
Capacitance tolerance 电容量公差	$\pm 20\%$ M									
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	2000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit						要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍初始规定值 $I_{leak} \leq$ 初始规定值		
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.020 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$									
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	10... 16	25... 35	50	63	80	100	160... 200	250... 400	450... 500
	$\tan \delta$	0.50	0.40	0.30	0.25	0.20	0.15	0.12	0.15	0.20
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	10	16...160	200...250			315...400		450	
	$Z(-25$ °C)	5	4	7			3		8	
	$Z(+20$ °C)									
	$Z(-40$ °C)	18	15	12			-		-	
	$Z(+20$ °C)									
Shelf life 储存寿命	After storage for 1000 h at 85 °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. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。									
Frequency multiplier for rated ripple current 额定纹波电流的频率系数		50 Hz	120 Hz	1 kHz			10 kHz		20 kHz	
	≤ 50 V	0.95	1.00	1.10			1.15		1.15	
	63...100 V	0.95	1.00	1.16			1.30		1.33	
	≥ 160 V	0.90	1.00	1.20			1.50		1.55	
Temperature multiplier for rated ripple current 额定纹波电流的温度系数		+40 °C	+55 °C	+70 °C			+85 °C			
	< 160 V	2.1	2.1	1.5			1.0			
	≥ 160 V	1.7	1.5	1.3			1.0			
Sectional specification 分规范	IEC 60384-4									



Dimension drawing

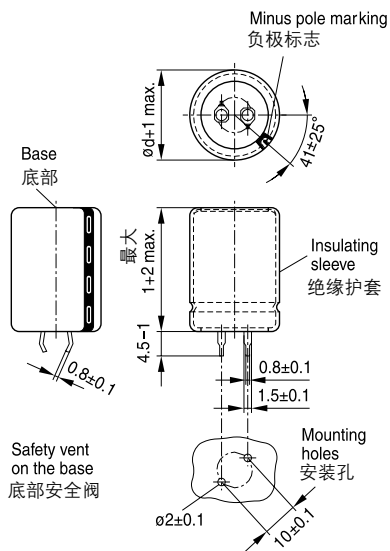
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals ($4.5-1$) mm
焊片式短针脚 ($4.5-1$) mm
digit 15 of part number = 7
订货编码第15位数 = 7



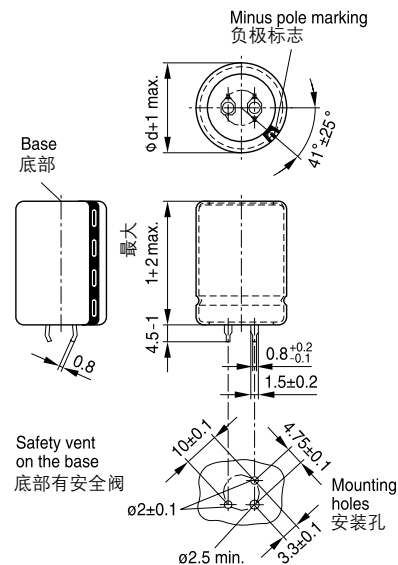
KAL1095-Q-E



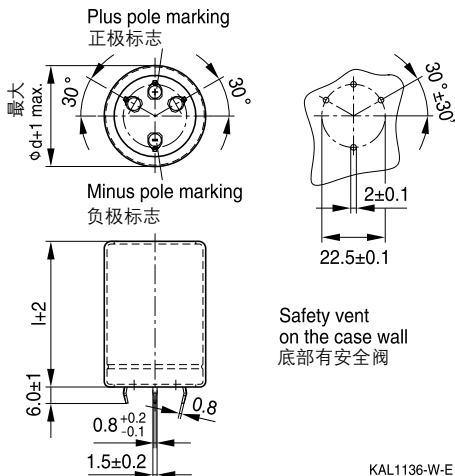
B41231, B43231

Standard series – 85 °C 标准型 – 85 °C

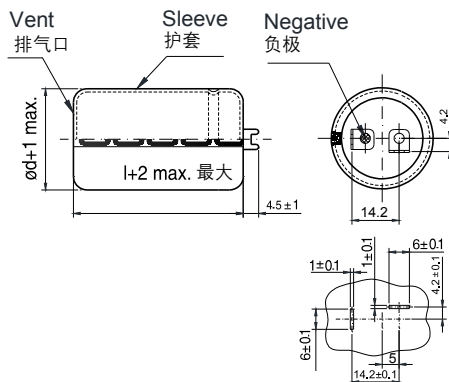
snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2



snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
10	12000	22 × 25	3.31	B41231A3129M0*#
	15000	22 × 30	3.82	B41231A3159M0*#
	15000	25.4 × 25	3.39	B41231B3159M0*#
	18000	22 × 35	4.28	B41231A3189M0*#
	18000	25.4 × 25	4.17	B41231B3189M0*#
	22000	22 × 40	4.79	B41231A3229M0*#
	22000	25.4 × 30	4.71	B41231B3229M0*#
	22000	30 × 25	4.83	B41231C3229M0*#
	27000	22 × 45	5.30	B41231A3279M0*#
	27000	25.4 × 35	5.26	B41231B3279M0*#
	27000	30 × 30	5.41	B41231C3279M0*#
	33000	22 × 50	5.82	B41231A3339M0*#
	33000	25.4 × 40	5.81	B41231B3339M0*#
	33000	30 × 30	5.69	B41231C3339M0*#
	33000	35 × 25	5.81	B41231D3339M0*#
	39000	25.4 × 45	6.31	B41231A3399M0*#
	39000	30 × 35	6.22	B41231B3399M0*#
	39000	35 × 30	6.38	B41231C3399M0*#
	47000	25.4 × 50	6.83	B41231A3479M0*#
	47000	30 × 40	6.78	B41231B3479M0*#
	47000	35 × 30	6.62	B41231C3479M0*#
	56000	30 × 45	7.31	B41231A3569M0*#
	56000	35 × 35	7.18	B41231B3569M0*#
	68000	35 × 40	7.76	B41231A3689M0*#
16	10000	22 × 25	3.32	B41231A4109M0*#
	12000	22 × 30	3.55	B41231A4129M0*#
	12000	25.4 × 25	3.89	B41231B4129M0*#
	15000	22 × 35	4.29	B41231A4159M0*#
	15000	25.4 × 30	4.45	B41231B4159M0*#
	15000	30 × 25	4.56	B41231C4159M0*#
	18000	22 × 40	4.77	B41231A4189M0*#
	18000	25.4 × 35	4.96	B41231B4189M0*#
	18000	30 × 30	5.10	B41231C4189M0*#
	22000	22 × 50	5.51	B41231A4229M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(4.5 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B41231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
16	22000 22000 27000 27000 27000 33000 33000 39000 39000 47000 47000 56000 68000	25.4 × 40 30 × 30 25.4 × 45 30 × 35 35 × 25 30 × 40 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45 35 × 50	5.51 5.39 6.06 5.98 5.80 6.56 6.41 7.08 6.96 7.62 7.54 8.08 8.53	B41231B4229M0*# B41231C4229M0*# B41231A4279M0*# B41231B4279M0*# B41231C4279M0*# B41231A4339M0*# B41231B4339M0*# B41231A4399M0*# B41231B4399M0*# B41231A4479M0*# B41231B4479M0*# B41231A4569M0*# B41231A4689M0*#
25	4700 5600 6800 6800 6800 8200 8200 10000 10000 12000 12000 12000 15000 15000 15000 18000 18000 22000 22000 27000 27000 33000 33000 39000	25.4 × 30 22 × 25 22 × 30 25.4 × 25 30 × 30 22 × 35 25.4 × 30 22 × 40 25.4 × 30 22 × 45 25.4 × 35 30 × 25 22 × 50 25.4 × 40 30 × 30 25.4 × 45 30 × 35 30 × 35 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45	2.7 2.65 3.06 3.15 3.03 3.45 3.57 3.95 3.89 4.41 4.37 3.99 4.94 4.94 4.50 5.45 5.10 5.38 5.51 6.22 6.12 6.82 6.74 7.35	B41231A5478M0*# B41231A5568M0*# B41231A5688M0*# B41231B5688M0*# B41231C5688M0*# B41231A5828M0*# B41231B5828M0*# B41231A5109M0*# B41231B5109M0*# B41231A5129M0*# B41231B5129M0*# B41231C5129M0*# B41231A5159M0*# B41231B5159M0*# B41231C5159M0*# B41231A5189M0*# B41231B5189M0*# B41231A5229M0*# B41231B5229M0*# B41231A5279M0*# B41231B5279M0*# B41231A5339M0*# B41231B5339M0*# B41231A5399M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(4.5 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V _R	C _R	Case dimensions	I _{AC,R}	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 d × l mm	120 Hz 85 °C A	订货编码
35	2200 2200 2700 3300 3900 3900 4700 4700 5600 5600 6800 6800 6800 8200 8200 8200 10000 10000 10000 10000 12000 12000 12000 15000 15000 18000 18000 22000	22 × 20 22 × 25 22 × 25 22 × 25 22 × 30 25 × 25 22 × 30 25.4 × 25 22 × 35 25.4 × 30 22 × 40 25.4 × 30 30 × 25 30 × 30 22 × 45 25.4 × 35 30 × 30 22 × 50 25.4 × 40 30 × 30 30 × 40 25.4 × 45 30 × 35 35 × 30 30 × 40 35 × 35 30 × 45 35 × 40 35 × 45	1.70 1.91 2.06 2.27 2.67 2.72 3.06 2.98 3.28 3.39 3.73 3.67 3.76 4.11 4.13 4.10 4.22 4.68 4.68 4.58 4.67 5.18 5.11 5.24 5.72 5.88 6.28 6.46 7.07	B41231A7228M0*# B41231B7228M0*# B41231A7278M0*# B41231A7338M0*# B41231A7398M0*# B41231B7398M0*# B41231A7478M0*# B41231B7478M0*# B41231A7568M0*# B41231B7568M0*# B41231A7688M0*# B41231B7688M0*# B41231C7688M0*# B41231D7688M0*# B41231A7828M0*# B41231B7828M0*# B41231C7828M0*# B41231A7109M0*# B41231B7109M0*# B41231C7109M0*# B41231D7109M0*# B41231A7129M0*# B41231C7129M0*# B41231D7129M0*# B41231A7159M0*# B41231B7159M0*# B41231A7189M0*# B41231B7189M0*# B41231A7229M0*#
50	2200 2700 3300 3300 3300 3900 4700 4700	22 × 25 22 × 30 22 × 30 25.4 × 25 30 × 30 25.4 × 30 22 × 40 25.4 × 35	2.25 2.49 2.97 3.06 3.34 3.58 3.83 3.98	B41231A6228M0*# B41231A6278M0*# B41231A6338M0*# B41231B6338M0*# B41231C6338M0*# B41231A6398M0*# B41231A6478M0*# B41231B6478M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)

2 = snap-in 3 terminals (4.5 - 1 mm)

4 = snap-in 4 terminals (6.0 ± 1 mm)

7 = snap-in short terminals (4.5 - 1 mm)

8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



B41231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
V DC	120 Hz 20 °C μF			
50	4700 4700 5600 5600 5600 5600 6800 6800 6800 6800 8200 8200 8200 10000 10000 12000 12000 15000 15000 18000	30 × 25 35 × 25 22 × 45 25.4 × 40 30 × 30 35 × 25 22 × 50 25.4 × 45 30 × 35 35 × 30 25.4 × 50 30 × 40 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45 35 × 50 35 × 50	3.86 4.19 4.26 4.44 4.35 4.44 4.77 4.76 4.92 5.04 5.43 5.38 5.26 6.07 5.97 6.62 6.55 7.20 7.58 7.74	B41231C6478M0*# B41231D6478M0*# B41231A6568M0*# B41231B6568M0*# B41231C6568M0*# B41231D6568M0*# B41231A6688M0*# B41231B6688M0*# B41231C6688M0*# B41231D6688M0*# B41231A6828M0*# B41231B6828M0*# B41231C6828M0*# B41231A6109M0*# B41231B6109M0*# B41231A6129M0*# B41231B6129M0*# B41231A6159M0*# B41231B6159M0*# B41231A6189M0*#
63	1800 2200 2200 2700 2700 3300 3300 3300 3300 3900 3900 3900 3900 4700 4700 4700 4700 4700	22 × 25 22 × 30 25.4 × 25 22 × 35 25.4 × 30 22 × 35 25.4 × 30 30 × 25 30 × 30 22 × 40 25.4 × 35 30 × 30 22 × 40 22 × 50 25.4 × 40 30 × 35 30 × 35 35 × 30	2.20 2.50 2.58 2.94 3.04 3.14 3.26 3.34 3.65 3.60 3.74 3.85 4.19 4.19 4.10 3.82 4.19	B41231A8188M0*# B41231A8228M0*# B41231B8228M0*# B41231A8278M0*# B41231B8278M0*# B41231A8338M0*# B41231B8338M0*# B41231C8338M0*# B41231D8338M0*# B41231A8398M0*# B41231B8398M0*# B41231C8398M0*# B41231A8478M0*# B41231B8478M0*# B41231C8478M0*# B41231E8478M0*# B41231D8478M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)

2 = snap-in 3 terminals (4.5 - 1 mm)

4 = snap-in 4 terminals (6.0 ± 1 mm)

7 = snap-in short terminals (4.5 - 1 mm)

8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V_{DC}	120 Hz	外壳尺寸	120 Hz	订货编码
	20 °C	d × l	85 °C	
	μF	mm	A	
63	5600	25.4 × 45	4.65	B41231A8568M0*#
	5600	30 × 35	4.58	B41231B8568M0*#
	5600	35 × 30	4.70	B41231C8568M0*#
	6800	25.4 × 50	5.20	B41231A8688M0*#
	6800	30 × 40	5.16	B41231B8688M0*#
	6800	35 × 30	5.04	B41231C8688M0*#
	8200	30 × 45	5.62	B41231A8828M0*#
	8200	35 × 35	5.53	B41231B8828M0*#
	10000	30 × 50	6.32	B41231A8109M0*#
	10000	35 × 40	6.25	B41231B8109M0*#
	12000	35 × 45	6.83	B41231A8129M0*#
80	1200	22 × 25	2.24	B41231A0128M0*#
	1500	22 × 30	2.67	B41231A0158M0*#
	1800	22 × 30	2.92	B41231A0188M0*#
	1800	25.4 × 25	3.01	B41231B0188M0*#
	2200	22 × 35	3.25	B41231A0228M0*#
	2200	25.4 × 30	3.36	B41231B0228M0*#
	2200	30 × 25	3.45	B41231C0228M0*#
	2700	22 × 40	3.79	B41231A0278M0*#
	2700	25.4 × 35	3.94	B41231B0278M0*#
	2700	30 × 30	4.05	B41231C0278M0*#
	3300	22 × 45	4.18	B41231A0338M0*#
	3300	25.4 × 40	4.36	B41231B0338M0*#
	3300	30 × 30	4.27	B41231C0338M0*#
	3900	22 × 50	4.75	B41231A0398M0*#
	3900	25.4 × 45	4.96	B41231B0398M0*#
	3900	30 × 35	4.89	B41231C0398M0*#
	4700	25.4 × 50	5.44	B41231A0478M0*#
	4700	30 × 40	5.39	B41231B0478M0*#
	4700	35 × 30	5.27	B41231C0478M0*#
	4700	30 × 45	5.71	B41231D0478M0*#
	5600	30 × 45	5.91	B41231A0568M0*#
	5600	35 × 35	5.81	B41231B0568M0*#
	6800	35 × 40	5.46	B41231A0688M0*#
	8200	35 × 45	6.91	B41231A0828M0*#
	10000	35 × 50	8.04	B41231A0109M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

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= 端子类型

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2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



B41231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
100	1000	25.4 × 30	2.46	B41231A9108M0*#
	1200	22 × 30	2.39	B41231A9128M0*#
	1200	25.4 × 25	2.46	B41231B9128M0*#
	1500	22 × 35	2.83	B41231A9158M0*#
	1500	25.4 × 30	2.93	B41231B9158M0*#
	1500	30 × 25	3.00	B41231C9158M0*#
	1800	22 × 40	3.26	B41231A9188M0*#
	1800	25.4 × 35	3.39	B41231B9188M0*#
	1800	30 × 30	3.49	B41231C9188M0*#
	2200	22 × 45	3.58	B41231A9228M0*#
	2200	25.4 × 40	3.74	B41231B9228M0*#
	2200	30 × 30	3.66	B41231C9228M0*#
	2700	25.4 × 45	4.33	B41231A9278M0*#
	2700	30 × 35	4.27	B41231B9278M0*#
	2700	35 × 30	4.37	B41231C9278M0*#
	3300	25.4 × 50	4.76	B41231A9338M0*#
	3300	30 × 40	4.72	B41231B9338M0*#
	3300	35 × 35	4.85	B41231C9338M0*#
	3900	30 × 45	5.36	B41231A9398M0*#
	3900	35 × 35	5.27	B41231B9398M0*#
	4700	30 × 50	5.86	B41231A9478M0*#
	4700	35 × 40	5.80	B41231B9478M0*#
	5600	35 × 45	6.34	B41231A9568M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions 外壳尺寸	$I_{AC,R}$	Ordering code 订货编码
V_{DC}	120 Hz 20 °C μF	$d \times l$ mm	120 Hz 85 °C A	
160	180	22 × 20	0.91	B43231A1187M0*#
	220	22 × 20	1.01	B43231A1227M0*#
	270	22 × 25	1.20	B43231A1277M0*#
	270	25.4 × 20	1.32	B43231B1277M0*#
	330	22 × 25	1.33	B43231A1337M0*#
	330	25.4 × 20	1.36	B43231B1337M0*#
	390	22 × 25	1.45	B43231A1397M0*#
	390	25.4 × 25	1.59	B43231B1397M0*#
	390	30 × 20	1.62	B43231C1397M0*#
	470	22 × 30	1.69	B43231A1477M0*#
	470	25.4 × 25	1.75	B43231B1477M0*#
	470	30 × 20	1.78	B43231C1477M0*#
	560	22 × 35	1.96	B43231A1567M0*#
	560	25.4 × 30	2.03	B43231B1567M0*#
	560	30 × 25	2.08	B43231C1567M0*#
	560	35 × 20	2.12	B43231D1567M0*#
	680	22 × 40	2.27	B43231A1687M0*#
	680	25.4 × 30	2.23	B43231B1687M0*#
	680	30 × 25	2.29	B43231C1687M0*#
	680	35 × 20	2.33	B43231D1687M0*#
	820	22 × 45	2.61	B43231A1827M0*#
	820	25.4 × 35	2.59	B43231B1827M0*#
	820	30 × 30	2.67	B43231C1827M0*#
	820	35 × 25	2.73	B43231D1827M0*#
	1000	22 × 50	3.01	B43231A1108M0*#
	1000	25.4 × 40	3.01	B43231B1108M0*#
	1000	30 × 30	2.95	B43231C1108M0*#
	1000	35 × 25	3.01	B43231D1108M0*#
	1200	25.4 × 45	3.23	B43231A1128M0*#
	1200	30 × 35	3.18	B43231B1128M0*#
	1200	35 × 30	3.26	B43231C1128M0*#
	1500	30 × 40	3.73	B43231A1158M0*#
	1500	35 × 35	3.83	B43231B1158M0*#
	1800	35 × 40	4.39	B43231A1188M0*#
	2200	35 × 40	4.85	B43231A1228M0*#
	2200	30 × 50	5.05	B43231B1228M0*#
	2200	35 × 50	5.42	B43231C1228M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)

2 = snap-in 3 terminals (4.5 - 1 mm)

4 = snap-in 4 terminals (6.0 ± 1 mm)

7 = snap-in short terminals (4.5 - 1 mm)

8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



B43231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V_{DC}	120 Hz	外壳尺寸	120 Hz	订货编码
	20 °C	d × l	85 °C	
	μF	mm	A	
200	180	22 × 20	0.91	B43231A2187M0*#
	220	22 × 25	1.09	B43231A2227M0*#
	220	25.4 × 20	1.11	B43231B2227M0*#
	270	22 × 25	1.20	B43231A2277M0*#
	270	25.4 × 25	1.32	B43231B2277M0*#
	270	30 × 20	1.35	B43231C2277M0*#
	330	22 × 30	1.42	B43231A2337M0*#
	330	25.4 × 25	1.46	B43231B2337M0*#
	330	30 × 20	1.49	B43231C2337M0*#
	390	22 × 30	1.54	B43231A2397M0*#
	390	25.4 × 25	1.59	B43231B2397M0*#
	390	30 × 25	1.74	B43231C2397M0*#
	390	35 × 20	1.77	B43231D2397M0*#
	470	22 × 35	1.79	B43231A2477M0*#
	470	25.4 × 30	1.86	B43231B2477M0*#
	470	30 × 25	1.90	B43231C2477M0*#
	470	35 × 20	1.94	B43231D2477M0*#
	560	22 × 40	2.06	B43231A2567M0*#
	560	25.4 × 35	2.14	B43231B2567M0*#
	560	30 × 25	2.08	B43231C2567M0*#
	560	35 × 20	2.25	B43231D2567M0*#
	680	22 × 45	2.38	B43231A2687M0*#
	680	25.4 × 40	2.48	B43231B2687M0*#
	680	30 × 30	2.43	B43231C2687M0*#
	680	35 × 25	2.48	B43231D2687M0*#
	820	22 × 50	2.73	B43231A2827M0*#
	820	25.4 × 45	2.85	B43231B2827M0*#
	820	30 × 35	2.81	B43231C2827M0*#
	820	35 × 30	2.88	B43231D2827M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(4.5 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions 外壳尺寸	$I_{AC,R}$	Ordering code 订货编码
V_{DC}	120 Hz 20 °C μF	$d \times l$ mm	120 Hz 85 °C A	
200	1000 1000 1000 1000 1200 1200 1500 1500 1800	25.4 × 50 30 × 40 35 × 30 35 × 35 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45	3.32 3.26 3.18 3.13 3.49 3.43 4.06 4.01 4.58	B43231D2108M0*# B43231A2108M0*# B43231B2108M0*# B43231C2108M0*# B43231A2128M0*# B43231B2128M0*# B43231A2158M0*# B43231B2158M0*# B43231A2188M0*#
250	150 150 180 180 220 220 220 270 270 270 330 330 330 330 390 390 390 390 470 470 470 470 560 560 560 560	22 × 25 25.4 × 20 22 × 25 25.4 × 20 22 × 25 25.4 × 25 30 × 20 22 × 30 25.4 × 25 30 × 20 22 × 35 25.4 × 30 30 × 25 35 × 20 22 × 40 25.4 × 30 30 × 25 35 × 20 22 × 45 25.4 × 35 30 × 30 35 × 25 22 × 50 25.4 × 40 30 × 30 35 × 25	0.90 0.92 0.90 1.01 1.09 1.19 1.22 1.28 1.32 1.35 1.50 1.56 1.60 1.62 1.72 1.69 1.73 1.77 1.98 1.96 2.02 2.06 2.26 2.25 2.20 2.25	B43231E2157M0*# B43231F2157M0*# B43231E2187M0*# B43231F2187M0*# B43231E2227M0*# B43231F2227M0*# B43231G2227M0*# B43231E2277M0*# B43231F2277M0*# B43231G2277M0*# B43231E2337M0*# B43231F2337M0*# B43231G2337M0*# B43231H2337M0*# B43231E2397M0*# B43231F2397M0*# B43231G2397M0*# B43231H2397M0*# B43231E2477M0*# B43231F2477M0*# B43231G2477M0*# B43231H2477M0*# B43231E2567M0*# B43231F2567M0*# B43231G2567M0*# B43231H2567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
250	680 680 680 820 820 1000 1000 1200 1500	25.4 × 45 30 × 35 35 × 30 30 × 40 35 × 35 30 × 45 35 × 40 35 × 45 35 × 50	2.60 2.56 2.62 2.95 3.03 3.40 3.50 3.74 4.35	B43231F2687M0*# B43231E2687M0*# B43231G2687M0*# B43231E2827M0*# B43231F2827M0*# B43231E2108M0*# B43231F2108M0*# B43231E2128M0*# B43231E2158M0*#
315	100 120 120 150 150 150 180 180 180 180 220 220 220 220 270 270 270 270 330 330 330 330 390 390 390	22 × 20 22 × 25 25.4 × 20 22 × 30 25.4 × 25 30 × 20 22 × 35 25.4 × 30 30 × 25 35 × 20 22 × 40 25.4 × 30 30 × 25 35 × 20 22 × 45 25.4 × 35 30 × 30 35 × 25 22 × 50 25.4 × 40 30 × 35 35 × 30 25.4 × 45 30 × 35 35 × 30	0.68 0.80 0.82 0.96 0.99 1.01 1.11 1.15 1.18 1.20 1.29 1.27 1.30 1.33 1.50 1.49 1.53 1.56 1.73 1.73 1.78 1.83 1.97 1.94 1.99	B43231A0107M0*# B43231A0127M0*# B43231B0127M0*# B43231A0157M0*# B43231B0157M0*# B43231C0157M0*# B43231A0187M0*# B43231B0187M0*# B43231C0187M0*# B43231D0187M0*# B43231A0227M0*# B43231B0227M0*# B43231C0227M0*# B43231D0227M0*# B43231A0277M0*# B43231B0277M0*# B43231C0277M0*# B43231D0277M0*# B43231A0337M0*# B43231B0337M0*# B43231C0337M0*# B43231D0337M0*# B43231A0397M0*# B43231B0397M0*# B43231C0397M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)

2 = snap-in 3 terminals (4.5 - 1 mm)

4 = snap-in 4 terminals (6.0 ± 1 mm)

7 = snap-in short terminals (4.5 - 1 mm)

8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
315	470 470 560 680 820	30 × 40 35 × 35 35 × 40 35 × 45 35 × 50	2.23 2.29 2.62 3.01 3.44	B43231A0477M0*# B43231B0477M0*# B43231A0567M0*# B43231A0687M0*# B43231A0827M0*#
350	82 100 100 120 120 120 150 150 150 180 180 180 220 220 220 220 270 270 270 270 330 330 330 390 390 470 470 560 680 820	22 × 20 22 × 25 25.4 × 20 22 × 30 25.4 × 25 30 × 20 22 × 35 25.4 × 30 30 × 20 22 × 40 25.4 × 35 30 × 25 35 × 20 22 × 45 25.4 × 35 30 × 30 35 × 25 22 × 50 25.4 × 45 30 × 35 35 × 25 25.4 × 50 30 × 40 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45 35 × 50 35 × 50	0.62 0.73 0.75 0.86 0.88 0.90 1.01 1.05 1.01 1.17 1.21 1.18 1.20 1.35 1.34 1.38 1.41 1.42 1.64 1.61 1.65 1.89 1.87 1.83 2.12 2.09 2.43 2.40 2.73 3.13 3.44	B43231A4826M0*# B43231A4107M0*# B43231B4107M0*# B43231A4127M0*# B43231B4127M0*# B43231C4127M0*# B43231A4157M0*# B43231B4157M0*# B43231C4157M0*# B43231A4187M0*# B43231B4187M0*# B43231C4187M0*# B43231D4187M0*# B43231A4227M0*# B43231B4227M0*# B43231C4227M0*# B43231D4227M0*# B43231D4277M0*# B43231A4277M0*# B43231B4277M0*# B43231C4277M0*# B43231A4337M0*# B43231B4337M0*# B43231C4337M0*# B43231A4397M0*# B43231B4397M0*# B43231A4477M0*# B43231B4477M0*# B43231A4567M0*# B43231A4687M0*# B43231A4827M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)

2 = snap-in 3 terminals (4.5 - 1 mm)

4 = snap-in 4 terminals (6.0 ± 1 mm)

7 = snap-in short terminals (4.5 - 1 mm)

8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

2 = 焊片式3端子(4.5 - 1 mm)

4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



B43231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
400	68	22 × 20	0.56	B43231A9686M0*#
	82	22 × 25	0.66	B43231A9826M0*#
	82	25.4 × 20	0.68	B43231B9826M0*#
	100	22 × 30	0.78	B43231A9107M0*#
	100	22 × 35	0.84	B43231D9107M0*#
	100	25.4 × 25	0.81	B43231B9107M0*#
	100	30 × 20	0.82	B43231C9107M0*#
	120	22 × 30	0.86	B43231B9127M0*#
	120	25.4 × 25	0.88	B43231A9127M0*#
	120	30 × 20	0.90	B43231C9127M0*#
	150	22 × 35	1.01	B43231A9157M0*#
	150	22 × 40	1.08	B43231E9157M0*#
	150	25.4 × 30	1.05	B43231B9157M0*#
	150	30 × 25	1.08	B43231C9157M0*#
	150	35 × 20	1.09	B43231D9157M0*#
	180	22 × 40	1.17	B43231A9187M0*#
	180	25.4 × 35	1.21	B43231B9187M0*#
	180	30 × 25	1.18	B43231C9187M0*#
	180	35 × 25	1.28	B43231D9187M0*#
	220	22 × 45	1.35	B43231E9227M0*#
	220	25.4 × 40	1.41	B43231F9227M0*#
	220	30 × 30	1.38	B43231B9227M0*#
	220	35 × 25	1.41	B43231D9227M0*#
	270	22 × 50	1.57	B43231D9277M0*#
	270	25.4 × 45	1.64	B43231A9277M0*#
	270	30 × 35	1.61	B43231B9277M0*#
	270	35 × 30	1.65	B43231C9277M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{AC,R}$	Ordering code
V_{DC}	120 Hz	外壳尺寸	120 Hz	订货编码
	20 °C	d × l	85 °C	
	μF	mm	A	
400	330	25.4 × 50	1.89	B43231C9337M0*#
	330	30 × 40	1.87	B43231A9337M0*#
	330	35 × 30	1.83	B43231B9337M0*#
	390	30 × 45	2.12	B43231C9397M0*#
	390	35 × 35	2.09	B43231B9397M0*#
	470	30 × 50	2.43	B43231B9477M0*#
	470	35 × 40	2.40	B43231A9477M0*#
	560	35 × 40	2.57	B43231B9567M0*#
	560	35 × 45	2.73	B43231A9567M0*#
	680	35 × 50	3.17	B43231A9687M0*#
	820	35 × 50	3.48	B43231A9827M0*#
	820	35 × 60	3.48	B43231B9827M0*#
450	56	22 × 20	0.39	B43231A5566M0*#
	68	22 × 25	0.46	B43231A5686M0*#
	68	25.4 × 20	0.47	B43231B5686M0*#
	82	22 × 30	0.54	B43231A5826M0*#
	82	25.4 × 25	0.56	B43231B5826M0*#
	82	30 × 20	0.57	B43231C5826M0*#
	100	22 × 35	0.63	B43231A5107M0*#
	100	25.4 × 30	0.65	B43231B5107M0*#
	100	30 × 25	0.67	B43231C5107M0*#
	100	35 × 20	0.68	B43231D5107M0*#
	120	22 × 40	0.73	B43231B5127M0*#
	120	25.4 × 35	0.76	B43231A5127M0*#
	120	30 × 25	0.73	B43231C5127M0*#
	120	35 × 20	0.75	B43231D5127M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43231

Standard series – 85 °C 标准型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R	Case dimensions	$I_{A,C,R}$	Ordering code
V DC	120 Hz 20 °C μF	外壳尺寸 $d \times l$ mm	120 Hz 85 °C A	订货编码
450	150	22 × 50	0.89	B43231A5157M0*#
	150	25.4 × 40	0.89	B43231B5157M0*#
	150	30 × 30	0.87	B43231C5157M0*#
	150	35 × 25	0.89	B43231D5157M0*#
	180	25.4 × 45	1.02	B43231A5187M0*#
	180	30 × 35	1.01	B43231B5187M0*#
	180	35 × 25	0.98	B43231C5187M0*#
	220	25.4 × 45	1.12	B43231D5227M0*#
	220	25.4 × 50	1.18	B43231B5227M0*#
	220	30 × 40	1.17	B43231A5227M0*#
	220	35 × 30	1.14	B43231C5227M0*#
	270	30 × 40	1.27	B43231C5277M0*#
	270	30 × 45	1.35	B43231A5277M0*#
	270	35 × 35	1.33	B43231B5277M0*#
	330	30 × 50	1.55	B43231B5337M0*#
	330	35 × 40	1.54	B43231A5337M0*#
	390	35 × 45	1.74	B43231A5397M0*#
	470	35 × 50	1.99	B43231A5477M0*#
	560	35 × 50	2.17	B43231A5567M0*#
	680	35 × 60	2.62	B43231A5687M0*#
	820	35 × 60	2.88	B43231A5827M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)

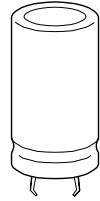
Long-life grade capacitors

长使用寿命级电容

Applications

应用

- Professional power supplies
专业电源
- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源



Features

特点

- High ripple current capability
耐高纹波电流
- High reliability
高可靠性
- RoHS-compatible
符合RoHS要求

Construction

结构

- Aluminum case, fully insulated
铝制外壳，整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管上标示负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B43232

Long life – 85 °C 长寿命 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

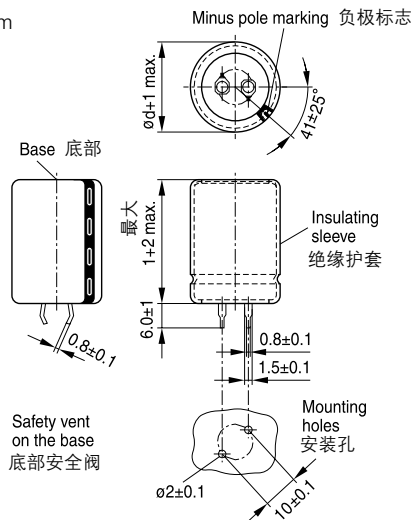
Rated voltage V_R 额定电压 V_R	200 ... 450 V DC						
Surge voltage V_S 浪涌电压 V_S	$V_R \leq 315$ V DC: 1.15 V_R $V_R > 315$ V DC: 1.1 V_R						
Operating temperature range 工作温度范围	$V_R \leq 250$ V DC: -40 °C ... +85 °C $V_R \geq 350$ V DC: -25 °C ... +85 °C						
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	68 ... 2200 μ F						
Capacitance tolerance 电容量公差	$\pm 20\%$ M						
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	3000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit			要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{leak} \leq$ 最初限值		
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5 分钟后)	$I_{leak} \leq 3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{1/2}$						
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	200 ... 400		450			
	$\tan \delta$	0.15		0.20			
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	200 ... 250		350 ... 450			
	$Z(-25 \text{ } ^\circ\text{C})$ $Z(+20 \text{ } ^\circ\text{C})$	3		8			
	$Z(-40 \text{ } ^\circ\text{C})$ $Z(+20 \text{ } ^\circ\text{C})$	12					
Shelf life 储存寿命	After storage for 1000 h at 85 °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. 85 °C 高温贮存 1000 小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电 30 分钟, 恢复 24 至 48 小时后再次测试。						
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	V_R (V DC)	50 Hz	120 Hz	1 kHz	10 kHz	50 kHz	
	200 ... 250	0.81	1.00	1.32	1.45	1.50	
	350 ... 450	0.77	1.00	1.30	1.41	1.43	
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C		+55 °C		+70 °C		+85 °C
	1.7		1.5		1.3		1.0
Sectional specification 分规范	IEC 60384-4						



Dimensional drawings

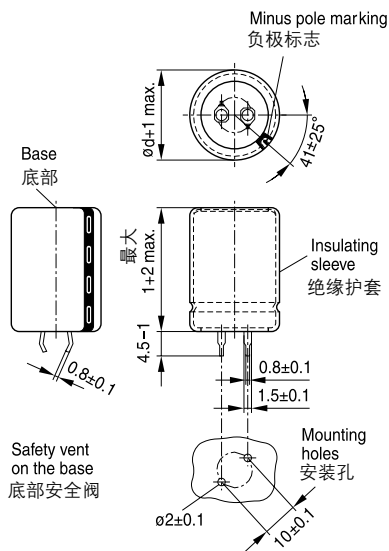
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals ($4.5-1$) mm
焊片式短针脚 ($4.5-1$) mm
digit 15 of part number = 7
订货编码第15位数 = 7



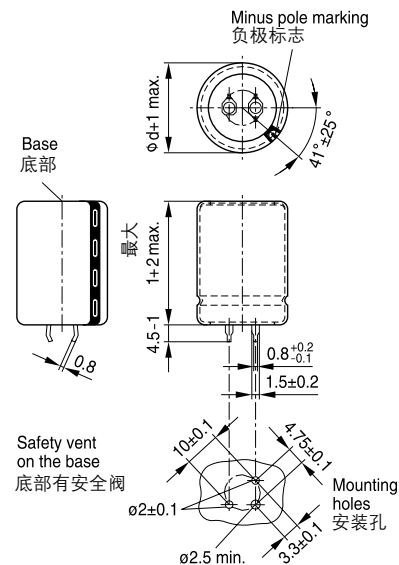
KAL1095-Q-E



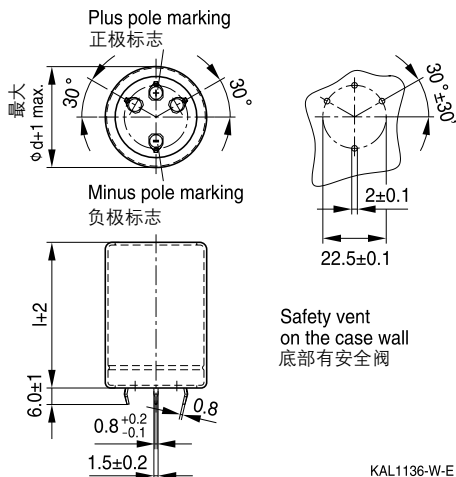
B43232

Long life – 85 °C 长寿命 – 85 °C

snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2

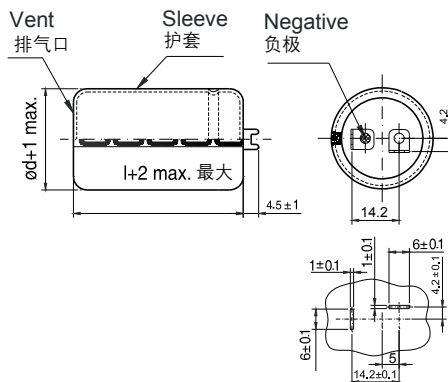


snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



KAL1136-W-E

snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical dates and ordering codes

技术参数与订货编码

V_R V DC	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
200	270	22 × 25	1.37	B43232A2277M0*#
	330	22 × 25	1.51	B43232A2337M0*#
	390	22 × 30	1.73	B43232A2397M0*#
	390	25.4 × 25	1.71	B43232B2397M0*#
	470	22 × 30	1.97	B43232A2477M0*#
	470	25.4 × 25	1.95	B43232B2477M0*#
	560	22 × 35	2.18	B43232A2567M0*#
	560	25.4 × 30	2.15	B43232B2567M0*#
	560	30 × 25	2.15	B43232C2567M0*#
	680	22 × 40	2.48	B43232A2687M0*#
	680	25.4 × 30	2.48	B43232B2687M0*#
	680	30 × 25	2.48	B43232C2687M0*#
	820	22 × 45	2.81	B43232A2827M0*#
	820	25.4 × 35	2.79	B43232B2827M0*#
	820	30 × 30	2.80	B43232C2827M0*#
	1000	22 × 50	3.28	B43232A2108M0*#
	1000	25.4 × 40	3.28	B43232B2108M0*#
	1000	30 × 35	3.15	B43232C2108M0*#
	1200	30 × 35	3.61	B43232A2128M0*#
	1200	35 × 30	3.57	B43232B2128M0*#
	1500	30 × 45	4.13	B43232A2158M0*#
	1500	35 × 35	4.06	B43232B2158M0*#
	1800	30 × 50	4.60	B43232A2188M0*#
	1800	35 × 40	4.59	B43232B2188M0*#
	2200	35 × 50	5.53	B43232A2228M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (4.5 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(4.5 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43232

Long life – 85 °C 长寿命 – 85 °C

Technical dates and ordering codes

技术参数与订货编码

V_R V DC	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
250	220	22 × 25	1.24	B43232A2227M0*#
	270	22 × 25	1.50	B43232B2277M0*#
	330	22 × 30	1.66	B43232B2337M0*#
	330	25.4 × 25	1.61	B43232C2337M0*#
	390	22 × 35	1.88	B43232C2397M0*#
	390	25.4 × 30	1.88	B43232D2397M0*#
	470	22 × 35	2.15	B43232C2477M0*#
	470	25.4 × 35	2.15	B43232D2477M0*#
	470	30 × 25	2.04	B43232E2477M0*#
	560	22 × 40	2.48	B43232D2567M0*#
	560	25.4 × 35	2.35	B43232E2567M0*#
	560	30 × 25	2.35	B43232F2567M0*#
	680	25.4 × 40	2.67	B43232D2687M0*#
	680	30 × 30	2.71	B43232E2687M0*#
	820	25.4 × 45	3.01	B43232D2827M0*#
	820	30 × 35	2.98	B43232E2827M0*#
	820	35 × 30	2.96	B43232F2827M0*#
	1000	30 × 40	3.56	B43232D2108M0*#
	1000	35 × 35	3.48	B43232E2108M0*#
	1200	30 × 45	3.99	B43232C2128M0*#
	1200	35 × 35	3.84	B43232D2128M0*#
	1500	35 × 40	4.33	B43232C2158M0*#
	1800	35 × 50	4.54	B43232C2188M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical dates and ordering codes

技术参数与订货编码

V_R V DC	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
400	82	22 × 25	0.84	B43232A9826M0*#
	100	22 × 25	0.95	B43232A9107M0*#
	120	22 × 30	1.09	B43232A9127M0*#
	120	25.4 × 25	1.13	B43232B9127M0*#
	150	22 × 35	1.24	B43232A9157M0*#
	150	25.4 × 30	1.27	B43232B9157M0*#
	180	22 × 40	1.41	B43232A9187M0*#
	180	25.4 × 30	1.44	B43232B9187M0*#
	180	30 × 25	1.52	B43232C9187M0*#
	220	22 × 45	1.58	B43232A9227M0*#
	220	25.4 × 35	1.64	B43232B9227M0*#
	220	30 × 30	1.66	B43232C9227M0*#
	270	25.4 × 40	1.79	B43232A9277M0*#
	270	30 × 30	1.82	B43232B9277M0*#
	330	25.4 × 45	2.00	B43232A9337M0*#
	330	30 × 35	2.05	B43232B9337M0*#
	330	35 × 30	2.05	B43232C9337M0*#
	390	30 × 40	2.26	B43232A9397M0*#
	390	35 × 35	2.28	B43232B9397M0*#
	470	30 × 45	2.51	B43232A9477M0*#
	470	35 × 35	2.51	B43232B9477M0*#
	560	30 × 50	2.85	B43232A9567M0*#
	560	35 × 40	2.85	B43232B9567M0*#
	680	35 × 50	3.10	B43232A9687M0*#

Composition of ordering code

订货编码的组成

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4 = snap-in 4 terminals (6.0 ± 1 mm)
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8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(4.5 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43232

Long life – 85 °C 长寿命 – 85 °C

Technical dates and ordering codes

技术参数与订货编码

V _R V DC	C _R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 d × l mm	I _{AC,R} 120 Hz 85 °C A	Ordering code 订货编码
450	68	22 × 25	0.71	B43232A5686M0*#
	82	22 × 25	0.86	B43232A5826M0*#
	100	22 × 35	1.03	B43232A5107M0*#
	100	25.4 × 25	0.97	B43232B5107M0*#
	120	22 × 35	1.07	B43232A5127M0*#
	120	25.4 × 30	1.09	B43232B5127M0*#
	120	30 × 25	1.12	B43232C5127M0*#
	150	22 × 40	1.18	B43232A5157M0*#
	150	25.4 × 30	1.25	B43232B5157M0*#
	150	30 × 25	1.29	B43232C5157M0*#
	180	22 × 45	1.32	B43232A5187M0*#
	180	25.4 × 35	1.40	B43232B5187M0*#
	180	30 × 30	1.45	B43232C5187M0*#
	220	25.4 × 40	1.59	B43232A5227M0*#
	220	30 × 30	1.64	B43232B5227M0*#
	220	35 × 25	1.59	B43232C5227M0*#
	270	30 × 35	1.89	B43232A5277M0*#
	270	35 × 30	1.90	B43232B5277M0*#
	330	30 × 40	2.12	B43232A5337M0*#
	330	35 × 35	2.15	B43232B5337M0*#
	390	30 × 45	2.35	B43232A5397M0*#
	390	35 × 40	2.38	B43232B5397M0*#
	470	35 × 45	2.68	B43232A5477M0*#
	560	35 × 50	2.88	B43232A5567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
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4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 -1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 -1 mm)
8 = 抗振性端子(4.5 ± 1 mm)

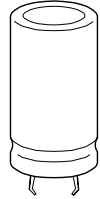
Long-life grade capacitors

长寿命级电容器

Applications

应用

- Frequency converters
变频器
- Uninterruptible power supplies
不间断电源
- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源



Features

特点

- Voltage derating ($0.93 V_R$) enables 105 °C operation, more details available upon request
电压降额 ($0.93 V_R$) 能在105 °C时工作, 详情可咨询。
- Long useful life
长使用寿命
- High reliability
可靠性高
- High ripple current capability
耐高纹波电流
- Low ESR
低等效串联电阻
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge/discharge-proof, polar
可充电/放电, 有极性
- Aluminum case, fully insulated
铝质外壳, 整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管上标示负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B43501

Long useful life – 85 °C 长使用寿命型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	400 ... 450 V DC				
Surge voltage V_S 浪涌电压 V_S	$1.10 \times V_R$				
Operating temperature range 工作温度范围	$V_R = 400 \text{ V DC} : -40 \text{ }^{\circ}\text{C} \dots +85 \text{ }^{\circ}\text{C}$ $V_R \geq 420 \text{ V DC} : -25 \text{ }^{\circ}\text{C} \dots +85 \text{ }^{\circ}\text{C}$				
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	47 ... 680 μF				
Capacitance tolerance 电容量公差	$\pm 20\%$ M				
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	> 10000 h Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit			要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{\text{leak}} \leq$ 最初限值	
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{\text{leak}} \leq 0.3 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{V_R}{\text{V}} \right)^{0.7} + 4 \mu\text{A}$				
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	400	420 ... 450		
	$\tan \delta$	0.15	0.20		
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	400	420 ... 450		
	$Z(-25 \text{ }^{\circ}\text{C})$	3	7		
	$Z(+20 \text{ }^{\circ}\text{C})$				
	$Z(-40 \text{ }^{\circ}\text{C})$	7	12		
	$Z(+20 \text{ }^{\circ}\text{C})$				
Shelf life 储存寿命	After storage for 1000 h at 85 °C, the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。				
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	0.85	1.00	1.30	1.31	1.32
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C	+70 °C	+85 °C	
	2.2	2.0	1.7	1.0	
Sectional specification 分规范	IEC 60384-4				

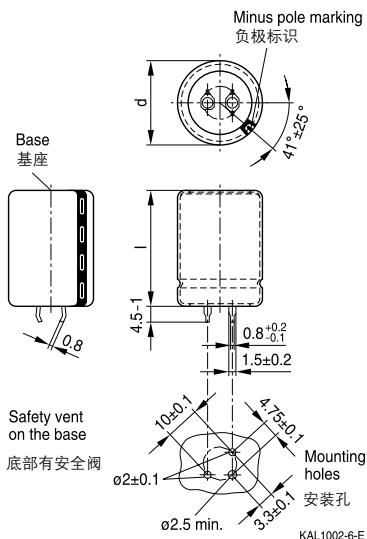
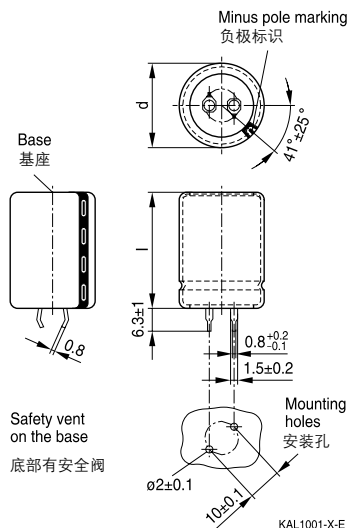


Dimensional drawings

尺寸图

Snap-in capacitors with standard insulation (PVC or PET)

焊片式标准绝缘电容器 (PVC or PET)



Snap-in terminals, length 6.3 ± 1 mm. Also available in a shorter version with a length of $4.5 - 1$ mm. PET insulation is marked with label "PET" on the sleeve.

焊片式端子，长 6.3 ± 1 mm。也可供长为度 $4.5 - 1$ mm 的较短型号产品。凡PET绝缘，套管上标注PET字样。

Snap-in capacitors are also available with 3 terminals (length $4.5 - 1$ mm). PET insulation is marked with label "PET" on the sleeve.

也可提供三端子焊片式电容器（长度 $4.5 - 1$ mm）凡PET绝缘，套管上标注PET字样。



B43501

Long useful life – 85 °C 长使用寿命型 – 85 °C

Ordering codes for terminal styles and insulation features

关于端子类型和绝缘特征的订货编码

Identification in 3rd block of ordering code

识别订货编码的第3方块

Snap-in capacitors

焊片式电容器

Terminal version 端子版本	Insulation version 绝缘版本	
	PVC	PET
Standard terminals 6.3 mm 标准端子	M000	M060
Short terminals 4.5 mm 短端子	M007	M067
3 terminals 4.5 mm 3端子	M002	M062

Ordering examples:

订购实例:

- B43501A9107M007 } snap-in capacitor with short terminals and standard PVC insulation
短针脚焊片电容器, 标准PVC绝缘
- B43501A9107M062 } snap-in capacitor with 3 terminals and PET insulation
3 针脚焊片电容器, PET 绝缘



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 d × l mm	ESR_{typ} 120 Hz 20 °C mΩ	Z_{max} 10 kHz 20 °C mΩ	$I_{AC,max}$ 120 Hz 60 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
400	68	22 x 25	920	1560	1.23	0.63	B43501A9686M0*#
	100	22 x 30	630	1060	1.59	0.81	B43501A9107M0*#
	100	25 x 25	630	1060	1.61	0.82	B43501B9107M0*#
	120	22 x 35	520	890	1.85	0.95	B43501A9127M0*#
	150	22 x 40	420	710	2.21	1.13	B43501A9157M0*#
	150	30 x 25	420	710	2.21	1.13	B43501B9157M0*#
	180	30 x 30	350	590	2.52	1.29	B43501A9187M0*#
	220	25 x 40	280	490	2.84	1.45	B43501A9227M0*#
	220	30 x 30	280	490	2.78	1.42	B43501C9227M0*#
	270	25 x 45	230	400	3.29	1.68	B43501B9277M0*#
	270	30 x 35	230	400	3.27	1.67	B43501A9277M0*#
	270	35 x 30	230	400	3.43	1.75	B43501C9277M0*#
	330	25 x 55	190	330	3.96	2.02	B43501B9337M0*#
	330	30 x 45	190	330	4.04	2.06	B43501A9337M0*#
	330	35 x 30	190	330	3.79	1.94	B43501C9337M0*#
	390	30 x 45	160	280	4.30	2.19	B43501B9397M0*#
	390	35 x 35	160	280	4.34	2.21	B43501C9397M0*#
	470	30 x 50	130	230	4.92	2.51	B43501B9477M0*#
	470	35 x 45	130	230	5.24	2.68	B43501A9477M0*#
	560	35 x 45	110	190	5.69	2.90	B43501B9567M0*#
	680	35 x 55	90	160	6.72	3.43	B43501A9687M0*#
420	100	22 x 30	1270	1600	1.59	0.81	B43501A0107M0*#
	100	25 x 25	1270	1600	1.61	0.82	B43501E0107M0*#
	120	25 x 30	1060	1330	1.90	0.97	B43501A0127M0*#
	150	22 x 40	850	1070	2.17	1.11	B43501A0157M0*#
	150	25 x 35	850	1070	2.24	1.14	B43501E0157M0*#
	180	25 x 35	710	890	2.44	1.25	B43501A0187M0*#
	180	30 x 30	710	890	2.53	1.30	B43501E0187M0*#
	220	25 x 40	580	730	2.84	1.45	B43501A0227M0*#
	220	30 x 35	580	730	2.95	1.50	B43501E0227M0*#

Composition of ordering code

订货编码的组成

- * = Insulation feature
0 = PVC insulation
6 = PET insulation

- * = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

- # = Terminal style
0 = snap-in standard terminals (6.3 mm)
2 = snap-in 3 terminals (4.5 mm)
7 = snap-in short terminals (4.5 mm)

- # = 端子类型
0 = 焊片式标准端子 (6.3 mm)
2 = 焊片式3端子 (4.5 mm)
7 = 焊片式短端子 (4.5 mm)

- 1) 120-Hz conversion factor of ripple current: $I_{AC} (120 \text{ Hz}) = 1.03 \cdot I_{AC} (100 \text{ Hz})$
纹波电流的120-Hz转换因数: $I_{AC} (120 \text{ Hz}) = 1.03 \cdot I_{AC} (100 \text{ Hz})$



B43501

Long useful life – 85 °C 长使用寿命型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 d × l mm	ESR _{typ} 120 Hz 20 °C mΩ	Z_{max} 10 kHz 20 °C mΩ	$I_{AC,max}$ 120 Hz 60 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
V DC							
420	270	25 x 55	470	590	3.56	1.82	B43501B0277M0*#
	270	30 x 35	470	590	3.27	1.67	B43501A0277M0*#
	270	35 x 30	470	590	3.45	1.76	B43501E0277M0*#
	330	30 x 45	390	490	3.96	2.02	B43501A0337M0*#
	330	35 x 35	390	490	4.00	2.04	B43501E0337M0*#
	390	30 x 50	330	410	4.48	2.29	B43501A0397M0*#
	470	30 x 55	270	340	5.10	2.61	B43501B0477M0*#
	470	35 x 45	270	340	5.20	2.66	B43501A0477M0*#
	560	35 x 50	230	290	5.91	3.02	B43501A0567M0*#
450	47	22 x 25	2710	3390	1.02	0.53	B43501A5476M0*#
	68	22 x 30	1870	2350	1.31	0.67	B43501A5686M0*#
	68	25 x 25	1870	2350	1.33	0.68	B43501B5686M0*#
	100	22 x 35	1270	1600	1.67	0.85	B43501D5107M0*#
	100	25 x 30	1270	1600	1.73	0.89	B43501B5107M0*#
	100	30 x 25	1270	1600	1.81	0.93	B43501C5107M0*#
	150	25 x 35	850	1070	2.21	1.13	B43501C5157M0*#
	150	30 x 30	850	1070	2.30	1.17	B43501B5157M0*#
	180	30 x 35	710	890	2.66	1.36	B43501A5187M0*#
	220	25 x 50	580	730	3.10	1.59	B43501B5227M0*#
	220	30 x 35	580	730	2.95	1.50	B43501C5227M0*#
	270	25 x 55	470	590	3.56	1.82	B43501B5277M0*#
	270	30 x 40	470	590	3.43	1.75	B43501C5277M0*#
	270	35 x 35	470	590	3.61	1.84	B43501D5277M0*#
	330	30 x 50	390	490	4.11	2.10	B43501B5337M0*#
	330	35 x 40	390	490	4.23	2.16	B43501A5337M0*#
	390	30 x 55	330	410	4.64	2.37	B43501A5397M0*#
	390	35 x 45	330	410	4.66	2.38	B43501B5397M0*#
	470	35 x 50	270	340	5.45	2.78	B43501A5477M0*#
	560	35 x 55	230	290	5.87	3.00	B43501A5567M0*#

Composition of ordering code

订货编码的组成

- * = Insulation feature
0 = PVC insulation
6 = PET insulation

- * = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

- # = Terminal style
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2 = snap-in 3 terminals (4.5 mm)
7 = snap-in short terminals (4.5 mm)

- # = 端子类型
0 = 焊片式标准端子 (6.3 mm)
2 = 焊片式3端子 (4.5 mm)
7 = 焊片式短端子 (4.5 mm)

- 1) 120-Hz conversion factor of ripple current: $I_{AC} (120 \text{ Hz}) = 1.03 \cdot I_{AC} (100 \text{ Hz})$
纹波电流的120-Hz转换因数: $I_{AC} (120 \text{ Hz}) = 1.03 \cdot I_{AC} (100 \text{ Hz})$

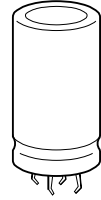
Long-life grade capacitors

长寿命级电容器

Applications

应用

- Frequency converters
变频器
- Switch-mode power supplies in industrial and consumer electronics
工业和消费电子的开关电源
- Uninterruptible power supplies
不间断供电



Features

特点

- Voltage derating ($0.88 \cdot V_R$ for $V_R \leq 450$ V) enables 105 °C operation, more details available upon request
降低额定工作电压且小于等于450 V产品($0.88 \cdot V_R$ for $V_R \leq 450$ V)能在105 °C工作。如有需要, 可提供更多详情
- Extremely high volumetric efficiency
超高容积效率
- High ripple current capability
耐高纹波电流
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge / discharge-proof, polar
可充放电, 有极性
- Aluminum case, fully insulated
铝制外壳, 整体绝缘
- Overload protection by safety vent on the case wall
外壳上的安全阀具备过载保护功能



B43510

Compact – 85 °C 小型化 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	385 ... 450 V DC					
Surge voltage V_S 浪涌电压 V_S	$1.10 \times V_R$					
Operating temperature range 工作温度范围	$V_R \leq 400$ V DC : -40 °C ... $+85$ °C $V_R > 400$ V DC : -25 °C ... $+85$ °C					
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	390 ... 2700 μ F					
Capacitance tolerance 电容量公差	$\pm 20\%$ M					
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	> 5000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit		要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{leak} \leq$ 最初限值		
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.7} + 4 \mu A$					
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	≤ 400	> 400			
	$\tan \delta$	0.15	0.20			
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	≤ 400	> 400			
	$Z(-25$ °C)	4	7			
	$Z(+20$ °C)					
	$Z(-40$ °C)	7	14			
	$Z(+20$ °C)					
Shelf life 储存寿命	After storage for 1000 h at 85 °C, the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。					
Frequency multiplier for rated ripple current 额定纹波电流的频率系数		50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	≤ 400 V	0.75	1.00	1.36	1.40	1.40
	> 400 V	0.77	1.00	1.29	1.33	1.33
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	$+40$ °C	$+55$ °C	$+70$ °C	$+85$ °C		
	2.2	2.0	1.7	1.0		
Sectional specification 分规范	IEC 60384-4					

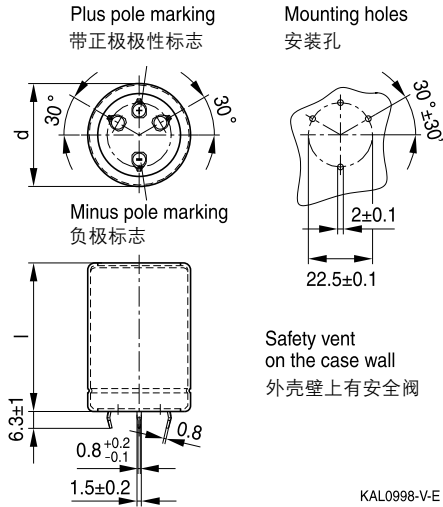


Dimensional drawings

尺寸图

B43510, 4-pin snap-in terminals, PVC insulation

B43510, 焊片式4 针脚, PVC 绝缘



Standard snap-in terminals:

标准焊片式针脚:

length (6.3 ± 1) mm.

长度 (6.3 ± 1) mm

Also available with length of (4.5 - 1) mm

长度 (4.5-1) mm 可选

All pin holes must be drilled into the PC-board, since the unconnected pins serve as mountings.

These pins must be soldered to isolated pads or pads with the same potential as the negative pole.

所有插板孔必须钻透印刷电路板, 未接触的针脚也需要封装。这些针脚必须焊接到独立衬垫上像负极的焊接一样。



B43510

Compact – 85 °C 小型化 – 85 °C

Ordering codes for terminal styles and insulation features

针脚类型与绝缘特点订购码

Identification in 3rd block of ordering code

第三栏确认订购码

4-pin snap-in terminal capacitors

4 针焊片式针脚电容器

Terminal version 针脚版本		Insulation version 绝缘版本
		PVC
Standard terminals 6.3 mm 标准针脚		M000
Short terminals 4.5 mm 短针脚		M007

Ordering examples: 订购实例:

B43510C9188M007 } 4-pin snap-in capacitor with short terminals and standard PVC insulation
4 针焊片式电容器, 短针脚, 标准 PVC 绝缘



Technical data and ordering codes

技术参数与订货编码

V _R	C _R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 d × l mm	ESR _{typ} 120 Hz 20 °C mΩ	Z _{max} 10 kHz 20 °C mΩ	I _{AC,max} 120 Hz 60 °C A	I _{AC,R} 120 Hz 85 °C A	Ordering code 订货编码
V DC							
385	680	35 x 50	130	160	7.05	3.59	B43510A3687M00#
	680	40 x 50	130	160	7.43	3.79	B43510B3687M00#
	820	35 x 60	100	130	8.29	4.23	B43510A3827M00#
	820	40 x 50	100	130	8.16	4.16	B43510B3827M00#
	1000	35 x 70	85	110	9.73	4.96	B43510A3108M00#
	1000	40 x 60	85	110	9.63	4.91	B43510B3108M00#
	1200	35 x 80	70	90	11.23	5.74	B43510A3128M00#
	1200	40 x 70	70	90	11.12	5.71	B43510B3128M00#
	1500	40 x 80	55	70	13.18	6.73	B43510A3158M00#
	1500	45 x 60	55	70	11.74	6.04	B43510B3158M00#
	1800	40 x 90	45	60	15.14	7.74	B43510C3188M00#
	1800	45 x 70	45	60	13.70	7.00	B43510B3188M00#
	2200	40 x 100	40	50	17.51	8.93	B43510A3228M00#
	2700	45 x 90	30	40	18.54	9.46	B43510B3278M00#
400	560	35 x 50	150	190	6.40	3.27	B43510A9567M00#
	560	40 x 40	150	190	6.24	3.18	B43510B9567M00#
	680	35 x 60	130	160	7.55	3.85	B43510A9687M00#
	680	40 x 50	130	160	7.43	3.79	B43510B9687M00#
	820	35 x 60	100	130	8.29	4.23	B43510A9827M00#
	820	40 x 50	100	130	8.16	4.16	B43510B9827M00#
	820	45 x 40	100	130	7.61	3.88	B43510C9827M00#
	1000	35 x 70	85	110	9.73	4.96	B43510A9108M00#
	1000	40 x 60	85	110	9.63	4.91	B43510B9108M00#
	1000	45 x 50	85	110	9.05	4.61	B43510C9108M00#
	1200	35 x 100	70	90	12.36	6.30	B43510A9128M00#
	1200	40 x 70	70	90	11.12	5.71	B43510B9128M00#
	1200	45 x 50	70	90	9.92	5.06	B43510C9128M00#
	1500	35 x 100	55	70	13.80	7.05	B43510A9158M00#
	1500	40 x 80	55	70	13.18	6.73	B43510B9158M00#
	1500	45 x 60	55	70	11.74	6.04	B43510D9158M00#
	1800	40 x 90	45	60	15.14	7.74	B43510C9188M00#
	1800	45 x 70	45	60	13.70	7.00	B43510D9188M00#
	2200	45 x 80	40	50	15.97	8.15	B43510B9228M00#
	2700	45 x 100	30	40	19.26	9.87	B43510A9278M00#

Composition of ordering code

订货编码的组成

= Terminal style

0 = 4-pin snap-in standard terminals

7 = 4-pin snap-in short terminals

= 引脚类型

0 = 4 针焊片式标准引脚

7 = 4 针焊片式短引脚



B43510

Compact – 85 °C 小型化 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C $m\Omega$	Z_{max} 10 kHz 20 °C $m\Omega$	$I_{AC,max}$ 120 Hz 60 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
420	680	35 x 60	220	240	7.55	3.85	B43510A0687M00#
	680	40 x 50	220	240	7.43	3.79	B43510B0687M00#
	820	35 x 70	180	200	8.82	4.49	B43510A0827M00#
	820	40 x 60	180	200	8.72	4.45	B43510B0827M00#
	1000	35 x 80	150	160	10.28	5.24	B43510A0108M00#
	1000	40 x 60	150	160	9.63	4.91	B43510B0108M00#
	1200	40 x 70	120	140	11.12	5.71	B43510A0128M00#
	1500	40 x 100	100	110	14.42	7.37	B43510A0158M00#
	1500	45 x 70	100	110	12.46	6.39	B43510B0158M00#
	1800	40 x 100	80	90	15.76	8.08	B43510A0188M00#
	1800	45 x 80	80	90	14.42	7.36	B43510B0188M00#
	2200	45 x 90	65	75	16.69	8.54	B43510A0228M00#
450	470	35 x 50	1310	350	5.86	2.99	B43510A5477M00#
	470	40 x 40	310	350	5.72	2.91	B43510B5477M00#
	560	35 x 60	260	290	6.85	3.49	B43510A5567M00#
	560	40 x 50	260	290	6.75	3.44	B43510B5567M00#
	680	35 x 70	220	240	8.02	4.09	B43510A5687M00#
	680	40 x 50	220	240	7.43	3.79	B43510B5687M00#
	680	45 x 40	220	240	6.93	3.53	B43510C5687M00#
	820	35 x 80	180	200	9.30	4.75	B43510A5827M00#
	820	40 x 60	180	200	8.72	4.45	B43510B5827M00#
	820	45 x 50	180	200	8.20	4.18	B43510D5827M00#
	1000	35 x 100	150	160	11.23	5.76	B43510A5108M00#
	1000	40 x 70	150	160	10.22	5.21	B43510B5108M00#
	1000	45 x 60	150	160	9.66	4.92	B43510C5108M00#
	1200	40 x 80	120	140	11.74	6.02	B43510A5128M00#
	1200	45 x 60	120	140	10.51	5.40	B43510C5128M00#
	1500	40 x 100	100	110	14.42	7.37	B43510A5158M00#
	1500	45 x 80	100	110	13.18	6.73	B43510B5158M00#
	1800	45 x 90	80	90	15.14	7.73	B43510B5188M00#
	2200	45 x 100	65	75	17.41	8.91	B43510A5228M00#

Composition of ordering code

订货编码的组成

= Terminal style

0 = 4-pin snap-in standard terminals

7 = 4-pin snap-in short terminals

= 引脚类型

0 = 4 针焊片式标准引脚

7 = 4 针焊片式短引脚

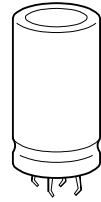
Long-life grade capacitors

长寿命级电容器

Applications

应用

- Frequency converters
变频器
- Switch-mode power supplies in industrial and consumer electronics
工业和消费电子产品中的开关电源
- Uninterruptible power supplies
不间断电源



Features

特点

- Voltage derating ($0.93 \cdot V_R$) enables 105 °C operation, more details available upon request
降低额定工作电压 ($0.93 \cdot V_R$) 能在105 °C时工作, 详情可咨询
- Long useful life
长使用寿命
- Outstanding ripple current capability
耐纹波电流性能优良
- High volumetric efficiency
容积效率高
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge/discharge-proof, polar
可充电/放电, 有极性
- Aluminum case, fully insulated
铝质外壳, 整体绝缘
- Overload protection by safety vent in case wall
外壳上安全阀过载保护



B43511

Outstanding ripple current – 85 °C 纹波电流优良型 – 85 °C

Specifications and characteristics in brief

规格性能参数一览表

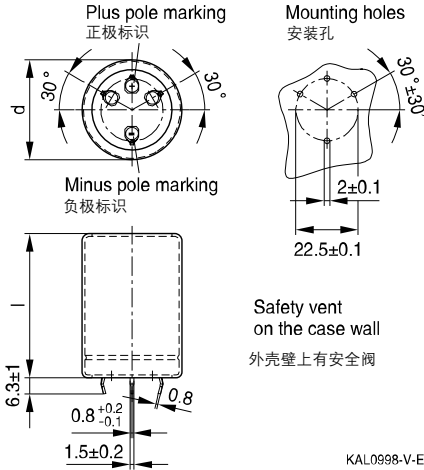
Rated voltage V _R 额定电压V _R	350 ... 450 V DC					
Surge voltage V _S 浪涌电压V _S	1.10 × V _R					
Operating temperature range 工作温度范围	V _R ≤ 400 V DC : -40 °C ... +85 °C V _R > 400 V DC : -25 °C ... +85 °C					
Rated capacitance C _R 额定电容量C _R (20 °C, 120 Hz)	390 ... 2200 μF					
Capacitance tolerance 电容量公差	± 20% M					
Useful life 使用寿命 (85 °C, V _R , I _{AC,R})	> 12000 h	Requirements: ΔC/C ≤ ± 20% of initial value tan δ ≤ 2 times initial specified limit I _{leak} ≤ initial specified limit			要求: ΔC/C ≤ 初始值的 ± 20% tan δ ≤ 2倍最初限值的 I _{leak} ≤ 最初限值	
Leakage current I _{leak} (20 °C, after 5 minutes) 漏电流I _{leak} (20 °C, 5分钟后)	I _{leak} ≤ 0.3 μA · (C _R / μF · V _R / V) ^{0.7} + 4 μA					
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V _R (V DC)	≤ 400			> 400	
	tan δ	0.15			0.20	
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V _R (V DC)	≤ 400			> 400	
	Z(-25 °C)	4			7	
	Z(+20 °C)					
	Z(-40 °C)	7			14	
	Z(+20 °C)					
Shelf life 储存寿命	After storage for 1000 h at 85 °C, the capacitors shall meet the requirement of useful life test after reforming process. After test: V _R to be applied for 30 minutes, 24 to 48 hours before measurement. 85 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。					
Frequency multiplier for rated ripple current 额定纹波电流的频率系数		50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	≤ 400 V	0.75	1.00	1.36	1.40	1.40
	> 400 V	0.77	1.00	1.29	1.33	1.33
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C		+70 °C	+85 °C	
	2.2	1.92		1.55	1.0	
Sectional specification 分规范	IEC 60384-4					



Dimensional drawings 尺寸图

B43511, 4-pin snap-in terminals, PVC insulation

B43511, 四脚焊片式端子, PVC 绝缘



Standard snap-in terminals:

length (6.3 ± 1) mm.

Also available with length of $(4.5 - 1)$ mm.

All pin holes must be drilled into the PC-board, since the unconnected pins serve as mountings. These pins must be soldered to isolated pads or pads with the same potential as the negative pole.

焊片式端子:

长 6.3 ± 1 mm。也可供长度为 $4.5 - 1$ mm 的较短型号产品。

由于未连接的针脚用作安装件，所以必须在印刷电路板上钻出所有针脚孔。这些针脚必须焊至隔离的垫子上，或使用相同电位作为负极的垫子上。



B43511

Outstanding ripple current – 85 °C 纹波电流优良型 – 85 °C

Ordering codes for terminal styles and insulation features

表示端子类型和绝缘特征的订单编码部分

Identification in 3rd block of ordering code

订单编码第三方块的认识

4-pin snap-in terminal capacitors

4脚焊片式端子电容器

Terminal version 端子版本		Insulation version 绝缘版本
		PVC
Standard terminals 标准端子	6.3 mm	M000
Short terminals 短端子	4.5 mm	M007

Ordering examples: 订单举例:

B43511A9188M007 } 4-pin snap-in capacitor with short terminals and standard PVC insulation
短端子、标准PVC绝缘4脚焊片式电容器



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C m Ω	Z_{max} 10 kHz 20 °C m Ω	$I_{AC,max}$ 120 Hz 60 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
350	560	35 x 50	150	190	5.9	3.3	B43511A4567M00#
	680	35 x 60	120	150	6.9	3.9	B43511A4687M00#
	680	40 x 50	120	150	6.8	3.8	B43511C4687M00#
	820	35 x 70	100	130	8.0	4.5	B43511A4827M00#
	820	40 x 60	100	130	8.0	4.4	B43511C4827M00#
	1000	35 x 80	85	110	9.5	5.2	B43511A4108M00#
	1000	40 x 60	85	110	8.9	4.9	B43511C4108M00#
	1000	45 x 50	85	110	8.3	4.6	B43511E4108M00#
	1500	40 x 80	55	70	12.2	6.7	B43511A4158M00#
	1500	45 x 70	55	70	11.5	6.4	B43511C4158M00#
	2200	45 x 100	40	50	16.1	8.9	B43511A4228M00#
400	470	35 x 50	180	220	5.4	3.0	B43511A9477M00#
	470	40 x 40	180	220	5.3	2.9	B43511C9477M00#
	560	35 x 60	150	190	6.3	3.5	B43511A9567M00#
	560	45 x 40	150	190	5.8	3.2	B43511C9567M00#
	680	35 x 70	120	150	7.3	4.1	B43511A9687M00#
	680	40 x 60	120	150	7.3	4.1	B43511C9687M00#
	680	45 x 50	120	150	6.8	3.8	B43511E9687M00#
	820	35 x 80	100	130	8.5	4.7	B43511A9827M00#
	820	40 x 60	100	130	8.0	4.4	B43511C9827M00#
	1000	35 x 100	85	110	10.4	5.8	B43511C9108M00#
	1000	40 x 70	85	110	9.4	5.2	B43511A9108M00#
	1000	45 x 60	85	110	8.9	4.9	B43511B9108M00#
	1500	40 x 100	55	70	13.3	7.4	B43511A9158M00#
	1500	45 x 80	55	70	12.2	6.7	B43511C9158M00#
	1800	45 x 100	45	60	14.5	8.1	B43511A9188M00#

Composition of ordering code

订货编码的组成

= Terminal style

端子类型

0 = 4-pin snap-in standard terminals

4针焊片式标准端子

7 = 4-pin snap-in short terminals

4针焊片式短端子



B43511

Outstanding ripple current – 85 °C 纹波电流优良型 – 85 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C μF	Case dimensions 外壳尺寸 $d \times l$ mm	ESR_{typ} 120 Hz 20 °C m Ω	Z_{max} 10 kHz 20 °C m Ω	$I_{AC,max}$ 120 Hz 60 °C A	$I_{AC,R}$ 120 Hz 85 °C A	Ordering code 订货编码
420	470	35 x 50	310	340	5.4	3.0	B43511A0477M00#
	470	40 x 40	310	340	5.3	2.9	B43511C0477M00#
	560	35 x 60	260	290	6.3	3.5	B43511A0567M00#
	560	40 x 50	260	290	6.2	3.4	B43511C0567M00#
	680	35 x 70	210	240	7.3	4.1	B43511A0687M00#
	680	40 x 60	210	240	7.3	4.1	B43511C0687M00#
	680	45 x 50	210	240	6.8	3.8	B43511E0687M00#
	820	35 x 80	180	200	8.5	4.7	B43511A0827M00#
	820	40 x 70	180	200	8.4	4.7	B43511C0827M00#
	820	45 x 50	180	200	7.5	4.2	B43511E0827M00#
	1000	35 x 100	140	160	10.4	5.8	B43511A0108M00#
	1000	40 x 80	140	160	9.9	5.5	B43511C0108M00#
	1000	45 x 60	140	160	8.9	4.9	B43511E0108M00#
	1500	40 x 100	100	110	13.3	7.4	B43511A0158M00#
	1500	45 x 80	100	110	12.2	6.7	B43511C0158M00#
	1800	45 x 100	80	90	14.5	8.1	B43511A0188M00#
450	390	35 x 50	370	410	4.8	2.7	B43511A5397M00#
	390	40 x 40	370	410	4.7	2.7	B43511C5397M00#
	470	35 x 60	310	340	5.8	3.2	B43511A5477M00#
	470	40 x 50	310	340	5.7	3.1	B43511C5477M00#
	470	45 x 40	310	340	5.3	2.9	B43511E5477M00#
	560	35 x 70	260	290	6.7	3.7	B43511A5567M00#
	560	40 x 60	260	290	6.6	3.7	B43511C5567M00#
	680	35 x 80	210	240	7.7	4.3	B43511A5687M00#
	680	40 x 60	210	240	7.3	4.1	B43511C5687M00#
	680	45 x 50	210	240	6.8	3.8	B43511E5687M00#
	820	40 x 70	180	200	8.4	4.7	B43511A5827M00#
	820	45 x 60	180	200	8.0	4.5	B43511C5827M00#
	1000	40 x 100	140	160	10.8	6.0	B43511A5108M00#
	1000	45 x 70	140	160	9.4	5.2	B43511C5108M00#
	1500	45 x 100	100	110	13.3	7.4	B43511A5158M00#

Composition of ordering code

订货编码的组成

= Terminal style

端子类型

0 = 4-pin snap-in standard terminals

4针焊片式标准端子

7 = 4-pin snap-in short terminals

4针焊片式短端子

General-purpose grade capacitors

通用级电容器

Applications

应用

- Switch-mode power supplies in industrial and entertainment electronics
用于工业和消费电子产品中的开关电源

Features

特点

- High ripple current capability
高纹波电流能力
- RoHS-compatible
符合RoHS要求

Construction

结构

- Aluminum case, fully insulated
铝质外壳, 整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管标注负极
- Overload protection by safety vent on the base
底部安全阀过载保护





B41252, B43252

Standard series – 105 °C 标准型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

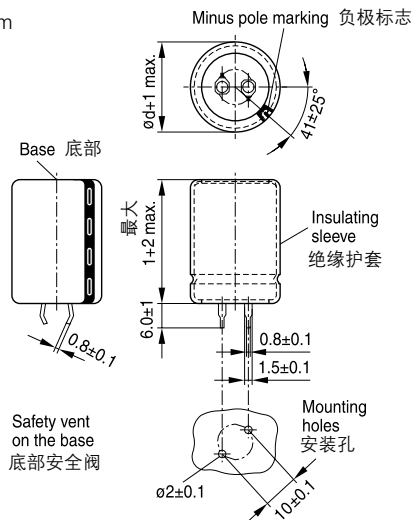
Rated voltage V_R 额定电压 V_R	10 ... 450 V DC									
Surge voltage V_S 浪涌电压 V_S	$V_R \leq 315 \text{ V DC} : 1.15 V_R \quad V_R > 315 \text{ V DC} : 1.1 V_R$									
Operating temperature range 工作温度范围	$V_R \leq 250 \text{ V DC} : -40 \text{ }^\circ\text{C} \dots +105 \text{ }^\circ\text{C}$ $V_R \geq 315 \text{ V DC} : -25 \text{ }^\circ\text{C} \dots +105 \text{ }^\circ\text{C}$									
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	47 ... 56000 μF									
Capacitance tolerance 电容量公差	$\pm 20\% \quad \text{M}$									
Useful life 使用寿命 (105 °C, V_R , $I_{AC,R}$)	2000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit					要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{\text{leak}} \leq$ 最初限值			
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{\text{leak}} \leq 0.02 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{V_R}{\text{V}} \right)$									
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	10	16	25	35... 50	63... 100	160... 200	250... 400	450... 500	
	$\tan \delta$	0.45	0.35	0.30	0.20	0.15	0.12	0.15	0.20	
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	10...16	25	35	50...63	80...100	160...250	315...400	450...500	
	$Z(-25 \text{ }^\circ\text{C})$	4	3	3	2	2	3	4	8	
	$Z(+20 \text{ }^\circ\text{C})$									
	$Z(-40 \text{ }^\circ\text{C})$	15	10	8	6	5	6			
	$Z(+20 \text{ }^\circ\text{C})$									
Shelf life 储存寿命	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. 105 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。									
Frequency multiplier for rated ripple current 额定纹波电流的频率系数		50 Hz	120 Hz		1 kHz		10 kHz		20 kHz	
	$\leq 50 \text{ V}$	0.95	1.00		1.10		1.15		1.15	
	63...100 V	0.95	1.00		1.16		1.30		1.33	
	$\geq 160 \text{ V}$	0.90	1.00		1.20		1.50		1.55	
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C		+55 °C		+70 °C		+85 °C		+105 °C	
	2.7		2.5		2.1		1.7		1.0	
Sectional specification 分规范	IEC 60384-4									



Dimensional drawings

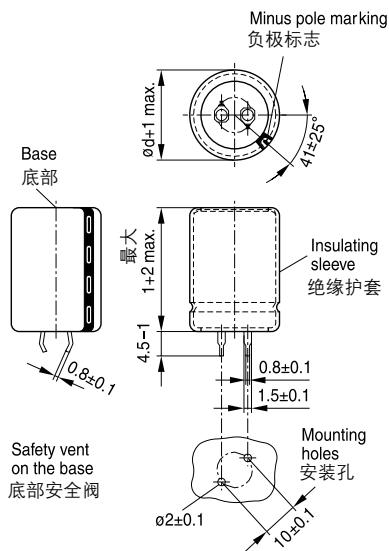
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals ($4.5-1$) mm
焊片式短针脚 ($4.5-1$) mm
digit 15 of part number = 7
订货编码第15位数 = 7



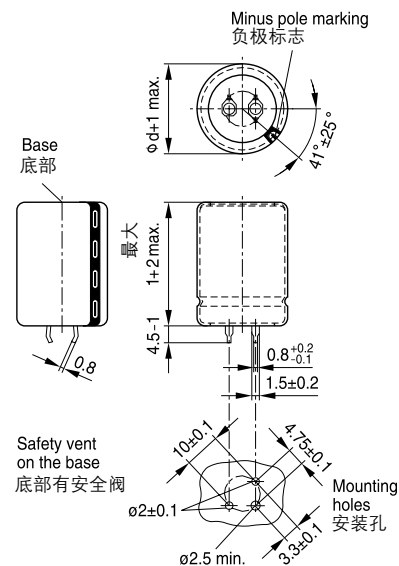
KAL1095-Q-E



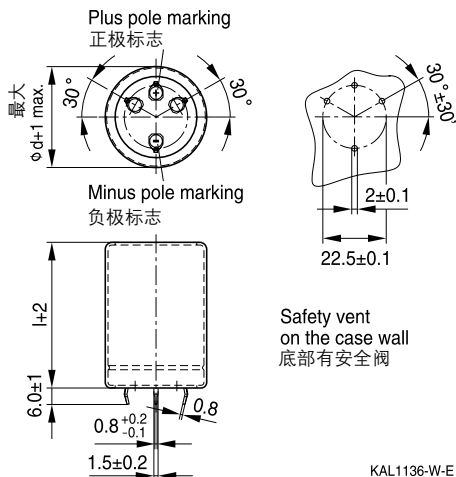
B41252, B43252

Standard series – 105 °C 标准型 – 105 °C

snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2

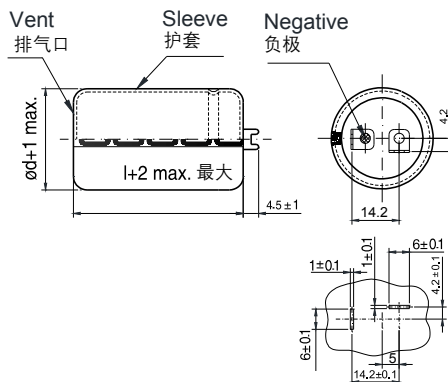


snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



KAL1136-W-E

snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
10	10000 12000 15000 15000 18000 18000 22000 22000 22000 27000 27000 27000 33000 33000 39000 39000 39000 39000 47000 47000 56000	22 × 25 22 × 30 22 × 35 25.4 × 25 22 × 35 25.4 × 30 22 × 40 25.4 × 35 30 × 25 22 × 50 25.4 × 40 30 × 30 25.4 × 45 30 × 35 25.4 × 50 30 × 40 35 × 30 30 × 45 35 × 35 35 × 45	2.17 2.48 2.83 2.75 3.00 3.11 3.35 3.48 3.38 3.88 3.87 3.79 4.26 4.20 4.60 4.57 4.46 4.95 4.87 5.49	B41252A3109M0*# B41252A3129M0*# B41252A3159M0*# B41252B3159M0*# B41252A3189M0*# B41252B3189M0*# B41252A3229M0*# B41252B3229M0*# B41252C3229M0*# B41252A3279M0*# B41252B3279M0*# B41252C3279M0*# B41252A3339M0*# B41252B3339M0*# B41252A3399M0*# B41252B3399M0*# B41252C3399M0*# B41252A3479M0*# B41252B3479M0*# B41252A3569M0*#
16	8200 10000 10000 12000 12000 12000 15000 15000 15000 15000 18000 18000 18000 18000 22000 22000	22 × 25 22 × 30 25.4 × 25 22 × 35 25.4 × 30 30 × 25 22 × 40 25.4 × 35 30 × 30 22 × 45 25.4 × 40 30 × 30 22 × 45 25.4 × 40 30 × 30 25.4 × 45 30 × 35	2.14 2.48 2.56 2.80 2.90 2.97 3.17 3.29 3.38 3.50 3.65 3.57 4.03 3.98	B41252A4828M0*# B41252A4109M0*# B41252B4109M0*# B41252A4129M0*# B41252B4129M0*# B41252C4129M0*# B41252A4159M0*# B41252B4159M0*# B41252C4159M0*# B41252A4189M0*# B41252B4189M0*# B41252C4189M0*# B41252A4229M0*# B41252B4229M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B41252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C	Ordering code 订货编码
V DC	μF		A	
16	27000 27000 27000 33000 33000 39000 39000 47000	25.4 × 50 30 × 40 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45	4.42 4.39 4.29 4.79 4.71 5.16 5.10 5.50	B41252A4279M0*# B41252B4279M0*# B41252C4279M0*# B41252A4339M0*# B41252B4339M0*# B41252A4399M0*# B41252B4399M0*# B41252A4479M0*#
25	4700 5600 6800 8200 8200 10000 10000 12000 12000 12000 15000 15000 15000 18000 18000 18000 22000 22000 27000	22 × 25 22 × 30 22 × 30 22 × 35 25.4 × 30 22 × 40 25.4 × 35 22 × 45 25.4 × 40 30 × 30 25.4 × 45 30 × 35 35 × 30 25.4 × 50 30 × 40 35 × 35 30 × 45 35 × 35 35 × 45	1.73 1.98 2.14 2.42 2.50 2.77 2.88 3.09 3.22 3.15 3.62 3.57 3.65 3.98 3.95 4.06 4.36 4.28 4.92	B41252A5478M0*# B41252A5568M0*# B41252A5688M0*# B41252A5828M0*# B41252B5828M0*# B41252A5109M0*# B41252B5109M0*# B41252A5129M0*# B41252B5129M0*# B41252C5129M0*# B41252A5159M0*# B41252B5159M0*# B41252C5159M0*# B41252A5189M0*# B41252B5189M0*# B41252C5189M0*# B41252A5229M0*# B41252B5229M0*# B41252A5279M0*#
35	3300 3900 4700 4700 5600 5600 5600	22 × 25 22 × 30 22 × 35 25.4 × 25 22 × 35 25.4 × 30 30 × 25	1.26 1.88 2.14 2.09 2.29 2.37 2.43	B41252A7338M0*# B41252B7398M0*# B41252A7478M0*# B41252B7478M0*# B41252A7568M0*# B41252B7568M0*# B41252C7568M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C	Ordering code 订货编码
V DC	μF		A	
35	6800	22 × 40	2.61	B41252A7688M0*#
	6800	25.4 × 35	2.71	B41252B7688M0*#
	6800	30 × 30	2.79	B41252C7688M0*#
	8200	22 × 50	3.02	B41252A7828M0*#
	8200	25.4 × 40	3.02	B41252B7828M0*#
	8200	30 × 30	2.95	B41252C7828M0*#
	10000	25.4 × 45	3.43	B41252A7109M0*#
	10000	30 × 35	3.38	B41252B7109M0*#
	12000	25.4 × 50	3.78	B41252A7129M0*#
	12000	30 × 40	3.75	B41252B7129M0*#
	12000	35 × 30	3.67	B41252C7129M0*#
	15000	30 × 45	4.19	B41252A7159M0*#
	15000	35 × 35	4.12	B41252B7159M0*#
	18000	35 × 40	4.52	B41252A7189M0*#
	22000	35 × 45	4.95	B41252A7229M0*#
50	2700	22 × 30	1.94	B41252A6278M0*#
	3300	22 × 35	2.20	B41252A6338M0*#
	3900	22 × 40	2.52	B41252A6398M0*#
	3900	25.4 × 35	2.62	B41252B6398M0*#
	3900	30 × 25	2.54	B41252C6398M0*#
	4700	22 × 45	2.81	B41252A6478M0*#
	4700	25.4 × 40	2.93	B41252B6478M0*#
	4700	30 × 30	2.87	B41252C6478M0*#
	5600	22 × 50	3.11	B41252A6568M0*#
	5600	25.4 × 40	3.11	B41252B6568M0*#
	5600	30 × 35	3.21	B41252C6568M0*#
	6800	25.4 × 50	3.64	B41252A6688M0*#
	6800	30 × 40	3.61	B41252B6688M0*#
	6800	35 × 30	3.53	B41252C6688M0*#
	8200	30 × 45	3.94	B41252A6828M0*#
	8200	35 × 35	3.87	B41252B6828M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B41252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
50	10000 10000 12000 15000	30 × 50 35 × 40 35 × 45 35 × 50	4.42 4.37 4.78 5.24	B41252A6109M0*# B41252B6109M0*# B41252A6129M0*# B41252A6159M0*#
63	1200 1500 1500 1800 1800 2200 2200 2700 2700 2700 3300 3300 3300 3900 3900 4700 4700 4700 5600 5600 6800 6800 8200 10000	22 × 25 22 × 30 25.4 × 25 22 × 30 25.4 × 25 22 × 35 25.4 × 30 22 × 40 25.4 × 30 30 × 25 22 × 50 25.4 × 40 30 × 30 25.4 × 45 30 × 35 25.4 × 50 30 × 40 35 × 30 30 × 45 35 × 35 30 × 50 35 × 40 35 × 45 35 × 50	1.37 1.50 1.54 1.64 1.69 1.86 1.92 2.17 2.13 2.18 2.53 2.53 2.48 2.88 2.84 3.20 3.17 3.10 3.51 3.46 3.92 3.88 4.22 4.74	B41252A8128M0*# B41252A8158M0*# B41252B8158M0*# B41252A8188M0*# B41252B8188M0*# B41252A8228M0*# B41252B8228M0*# B41252A8278M0*# B41252B8278M0*# B41252C8278M0*# B41252A8338M0*# B41252B8338M0*# B41252C8338M0*# B41252A8398M0*# B41252B8398M0*# B41252A8478M0*# B41252B8478M0*# B41252C8478M0*# B41252A8568M0*# B41252B8568M0*# B41252A8688M0*# B41252B8688M0*# B41252A8828M0*# B41252A8109M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
80	820	22 × 25	1.37	B41252A0827M0*#
	1000	22 × 30	1.62	B41252A0108M0*#
	1000	25.4 × 25	1.67	B41252B0108M0*#
	1200	22 × 30	1.67	B41252A0128M0*#
	1200	25.4 × 25	1.72	B41252B0128M0*#
	1500	22 × 35	1.98	B41252A0158M0*#
	1500	25.4 × 30	2.05	B41252B0158M0*#
	1800	22 × 40	2.28	B41252A0188M0*#
	1800	25.4 × 35	2.37	B41252B0188M0*#
	1800	30 × 25	2.30	B41252C0188M0*#
	2200	22 × 45	2.51	B41252A0228M0*#
	2200	25.4 × 35	2.49	B41252B0228M0*#
	2200	30 × 30	2.56	B41252C0228M0*#
	2700	25.4 × 45	3.03	B41252A0278M0*#
	2700	30 × 35	2.99	B41252B0278M0*#
	3300	25.4 × 50	3.33	B41252A0338M0*#
	3300	30 × 40	3.30	B41252B0338M0*#
	3300	35 × 30	3.23	B41252C0338M0*#
	3900	30 × 45	3.75	B41252A0398M0*#
	3900	35 × 35	3.69	B41252B0398M0*#
	4700	30 × 50	4.10	B41252A0478M0*#
	4700	35 × 40	4.06	B41252B0478M0*#
	5600	35 × 45	4.44	B41252A0568M0*#
	6800	35 × 50	4.90	B41252A0688M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B41252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
100	820	22 × 30	1.46	B41252A9827M0*#
	820	25.4 × 25	1.51	B41252B9827M0*#
	1000	22 × 35	1.71	B41252A9108M0*#
	1000	25.4 × 30	1.77	B41252B9108M0*#
	1200	22 × 40	1.86	B41252A9128M0*#
	1200	25.4 × 35	1.94	B41252B9128M0*#
	1200	30 × 25	1.88	B41252C9128M0*#
	1500	22 × 45	2.18	B41252A9158M0*#
	1500	25.4 × 40	2.28	B41252B9158M0*#
	1500	30 × 30	2.23	B41252C9158M0*#
	1800	25.4 × 45	2.61	B41252A9188M0*#
	1800	30 × 35	2.57	B41252B9188M0*#
	2200	25.4 × 50	2.85	B41252A9228M0*#
	2200	30 × 40	2.83	B41252B9228M0*#
	2200	35 × 30	2.76	B41252C9228M0*#
	2700	30 × 45	3.27	B41252A9278M0*#
	2700	35 × 35	3.22	B41252B9278M0*#
	3300	30 × 50	3.59	B41252A9338M0*#
	3300	35 × 40	3.55	B41252B9338M0*#
	3900	35 × 45	4.03	B41252A9398M0*#
	4700	35 × 50	4.40	B41252B9478M0*#
	4700	35 × 50	4.40	B41252A9478M0*#
	5600	35 × 60	4.78	B41252A9568M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
160	180	22 × 20	0.69	B43252A1187M0*#
	220	22 × 20	0.76	B43252A1227M0*#
	270	22 × 25	0.91	B43252A1277M0*#
	270	25.4 × 20	0.93	B43252B1277M0*#
	330	22 × 25	1.01	B43252A1337M0*#
	330	25.4 × 25	1.10	B43252B1337M0*#
	330	30 × 20	1.13	B43252C1337M0*#
	390	22 × 30	1.17	B43252A1397M0*#
	390	25.4 × 25	1.20	B43252B1397M0*#
	390	30 × 20	1.23	B43252D1397M0*#
	470	22 × 35	1.36	B43252A1477M0*#
	470	25.4 × 25	1.32	B43252B1477M0*#
	470	30 × 25	1.44	B43252C1477M0*#
	470	35 × 20	1.47	B43252D1477M0*#
	560	22 × 40	1.56	B43252A1567M0*#
	560	25.4 × 30	1.53	B43252B1567M0*#
	560	30 × 25	1.57	B43252C1567M0*#
	560	35 × 25	1.70	B43252D1567M0*#
	680	22 × 45	1.80	B43252A1687M0*#
	680	25.4 × 35	1.79	B43252B1687M0*#
	680	30 × 25	1.73	B43252C1687M0*#
	680	35 × 25	1.88	B43252D1687M0*#
	820	22 × 50	2.06	B43252A1827M0*#
	820	25.4 × 40	2.06	B43252B1827M0*#
	820	30 × 30	2.02	B43252C1827M0*#
	820	35 × 25	2.06	B43252D1827M0*#
	1000	25.4 × 45	2.38	B43252A1108M0*#
	1000	30 × 35	2.35	B43252B1108M0*#
	1000	35 × 30	2.41	B43252C1108M0*#
	1200	25.4 × 50	2.52	B43252A1128M0*#
	1200	30 × 40	2.50	B43252B1128M0*#
	1200	35 × 30	2.44	B43252C1128M0*#
	1500	35 × 40	3.00	B43252A1158M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
200	150	22 × 20	0.63	B43252A2157M0*#
	180	22 × 20	0.69	B43252A2187M0*#
	220	22 × 25	0.82	B43252A2227M0*#
	220	25.4 × 20	0.84	B43252B2227M0*#
	270	22 × 30	0.91	B43252A2277M0*#
	270	25.4 × 25	1.00	B43252B2277M0*#
	270	30 × 20	1.02	B43252C2277M0*#
	330	22 × 30	1.07	B43252A2337M0*#
	330	25.4 × 25	1.11	B43252D2337M0*#
	330	30 × 20	1.13	B43252B2337M0*#
	390	22 × 35	1.24	B43252A2397M0*#
	390	25.4 × 30	1.28	B43252B2397M0*#
	390	30 × 25	1.31	B43252C2397M0*#
	390	35 × 20	1.34	B43252D2397M0*#
	470	22 × 40	1.43	B43252A2477M0*#
	470	25.4 × 35	1.40	B43252D2477M0*#
	470	30 × 25	1.44	B43252B2477M0*#
	470	35 × 25	1.56	B43252C2477M0*#
	560	22 × 45	1.63	B43252A2567M0*#
	560	25.4 × 40	1.62	B43252B2567M0*#
	560	30 × 30	1.67	B43252C2567M0*#
	560	35 × 25	1.70	B43252D2567M0*#
	680	22 × 50	1.88	B43252A2687M0*#
	680	25.4 × 45	1.96	B43252D2687M0*#
	680	30 × 30	1.84	B43252B2687M0*#
	680	35 × 25	1.88	B43252C2687M0*#
	820	25.4 × 50	2.25	B43252A2827M0*#
	820	30 × 35	2.13	B43252B2827M0*#
	820	35 × 30	2.18	B43252C2827M0*#
	1000	30 × 45	2.57	B43252A2108M0*#
	1000	35 × 35	2.53	B43252B2108M0*#
	1200	30 × 50	2.72	B43252A2128M0*#
	1200	35 × 35	2.57	B43252B2128M0*#
	1500	35 × 45	3.13	B43252A2158M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AG,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
250	150	22 × 25	0.68	B43252E2157M0*#
	150	25.4 × 20	0.69	B43252F2157M0*#
	180	22 × 25	0.74	B43252E2187M0*#
	180	25.4 × 20	0.76	B43252F2187M0*#
	180	30 × 20	0.83	B43252G2187M0*#
	220	22 × 30	0.88	B43252E2227M0*#
	220	25.4 × 25	0.90	B43252F2227M0*#
	220	30 × 20	0.92	B43252G2227M0*#
	270	22 × 35	1.03	B43252E2277M0*#
	270	25.4 × 30	1.06	B43252F2277M0*#
	270	30 × 20	0.97	B43252H2277M0*#
	270	30 × 25	1.09	B43252G2277M0*#
	270	35 × 20	1.11	B43252D2277M0*#
	330	22 × 35	1.12	B43252H2337M0*#
	330	22 × 40	1.20	B43252E2337M0*#
	330	25.4 × 30	1.18	B43252F2337M0*#
	330	30 × 25	1.21	B43252G2337M0*#
	330	35 × 20	1.23	B43252C2337M0*#
	390	22 × 45	1.36	B43252E2397M0*#
	390	25.4 × 40	1.42	B43252F2397M0*#
	390	30 × 30	1.39	B43252G2397M0*#
	390	35 × 25	1.42	B43252H2397M0*#
	470	22 × 50	1.56	B43252E2477M0*#
	470	25.4 × 40	1.56	B43252F2477M0*#
	470	30 × 30	1.53	B43252G2477M0*#
	470	35 × 25	1.56	B43252H2477M0*#
	560	25.4 × 50	1.86	B43252E2567M0*#
	560	30 × 35	1.76	B43252F2567M0*#
	560	35 × 30	1.80	B43252G2567M0*#
	680	25.4 × 50	2.05	B43252G2687M0*#
	680	30 × 45	2.12	B43252E2687M0*#
	680	35 × 35	2.09	B43252F2687M0*#
	820	35 × 40	2.40	B43252E2827M0*#
	1000	35 × 45	2.76	B43252E2108M0*#
	1200	35 × 50	2.91	B43252E2128M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
315	82	22 × 20	0.45	B43252A0826M0*#
	100	22 × 25	0.53	B43252A0107M0*#
	100	25.4 × 20	0.55	B43252B0107M0*#
	120	22 × 30	0.62	B43252A0127M0*#
	120	25.4 × 25	0.64	B43252B0127M0*#
	120	30 × 20	0.65	B43252C0127M0*#
	150	22 × 35	0.74	B43252A0157M0*#
	150	25.4 × 30	0.76	B43252B0157M0*#
	150	30 × 20	0.73	B43252C0157M0*#
	180	22 × 40	0.85	B43252A0187M0*#
	180	25.4 × 35	0.88	B43252B0187M0*#
	180	30 × 25	0.86	B43252C0187M0*#
	180	35 × 20	0.87	B43252D0187M0*#
	220	22 × 45	0.98	B43252A0227M0*#
	220	25.4 × 35	0.98	B43252B0227M0*#
	220	30 × 30	1.00	B43252C0227M0*#
	220	35 × 20	0.96	B43252D0227M0*#
	270	25.4 × 45	1.19	B43252A0277M0*#
	270	30 × 35	1.17	B43252B0277M0*#
	270	35 × 25	1.14	B43252C0277M0*#
	330	25.4 × 50	1.37	B43252A0337M0*#
	330	30 × 40	1.36	B43252B0337M0*#
	330	35 × 30	1.33	B43252C0337M0*#
	390	30 × 45	1.54	B43252A0397M0*#
	390	35 × 35	1.52	B43252B0397M0*#
	470	30 × 50	1.76	B43252A0477M0*#
	470	35 × 40	1.74	B43252B0477M0*#
	560	35 × 40	1.90	B43252A0567M0*#
	680	35 × 50	2.27	B43252A0687M0*#
	820	35 × 50	2.49	B43252A0827M0*#
	1000	35 × 55	2.87	B43252A0108M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
350	68	22 × 20	0.41	B43252A4686M0*#
	82	22 × 25	0.48	B43252A4826M0*#
	82	25.4 × 20	0.49	B43252B4826M0*#
	100	22 × 25	0.53	B43252A4107M0*#
	100	25.4 × 25	0.59	B43252B4107M0*#
	100	30 × 20	0.60	B43252C4107M0*#
	120	22 × 30	0.62	B43252A4127M0*#
	120	25.4 × 25	0.64	B43252B4127M0*#
	120	30 × 20	0.65	B43252C4127M0*#
	150	22 × 40	0.78	B43252A4157M0*#
	150	25.4 × 30	0.76	B43252B4157M0*#
	150	30 × 25	0.78	B43252C4157M0*#
	150	35 × 20	0.80	B43252D4157M0*#
	180	22 × 45	0.89	B43252A4187M0*#
	180	25.4 × 35	0.88	B43252B4187M0*#
	180	30 × 30	0.91	B43252C4187M0*#
	180	35 × 20	0.87	B43252D4187M0*#
	220	22 × 50	1.03	B43252A4227M0*#
	220	25.4 × 40	1.03	B43252B4227M0*#
	220	30 × 30	1.00	B43252C4227M0*#
	220	35 × 25	1.03	B43252D4227M0*#
	270	25.4 × 45	1.19	B43252A4277M0*#
	270	30 × 35	1.17	B43252B4277M0*#
	270	35 × 30	1.20	B43252C4277M0*#
	330	30 × 40	1.36	B43252A4337M0*#
	330	35 × 35	1.40	B43252B4337M0*#
	390	30 × 45	1.54	B43252A4397M0*#
	390	35 × 40	1.59	B43252B4397M0*#
	470	35 × 45	1.82	B43252A4477M0*#
	560	35 × 50	2.06	B43252A4567M0*#
	680	35 × 50	2.27	B43252A4687M0*#
	820	35 × 55	2.60	B43252A4827M0*#
	1000	35 × 60	2.98	B43252A4108M0*#

Composition of ordering code

订货编码的组成

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8 = 抗振性端子(4.5 ± 1 mm)



B43252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
400	56	22 × 20	0.37	B43252A9566M0*#
	68	22 × 25	0.44	B43252A9686M0*#
	68	25.4 × 20	0.45	B43252B9686M0*#
	82	22 × 30	0.51	B43252A9826M0*#
	82	25.4 × 25	0.53	B43252B9826M0*#
	82	25.4 × 30	0.58	B43252D9826M0*#
	82	30 × 20	0.54	B43252C9826M0*#
	100	22 × 35	0.60	B43252A9107M0*#
	100	25.4 × 30	0.62	B43252C9107M0*#
	100	30 × 20	0.60	B43252B9107M0*#
	120	22 × 40	0.69	B43252A9127M0*#
	120	25.4 × 30	0.68	B43252B9127M0*#
	120	30 × 25	0.70	B43252C9127M0*#
	120	35 × 20	0.71	B43252D9127M0*#
	150	22 × 45	0.81	B43252A9157M0*#
	150	25.4 × 35	0.81	B43252B9157M0*#
	150	30 × 30	0.83	B43252C9157M0*#
	150	35 × 20	0.80	B43252D9157M0*#
	180	22 × 50	0.93	B43252A9187M0*#
	180	25.4 × 40	0.93	B43252B9187M0*#
	180	30 × 30	0.91	B43252C9187M0*#
	180	35 × 25	0.93	B43252D9187M0*#
	220	22 × 45	0.98	B43252D9227M0*#
	220	25.4 × 45	1.07	B43252C9227M0*#
	220	30 × 35	1.06	B43252A9227M0*#
	220	35 × 30	1.08	B43252B9227M0*#
	270	22 × 50	1.14	B43252D9277M0*#
	270	25.4 × 50	1.24	B43252A9277M0*#
	270	30 × 40	1.23	B43252B9277M0*#
	270	35 × 30	1.20	B43252C9277M0*#

Composition of ordering code

订货编码的组成

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Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V_{DC}	μF			
400	330 330 390 390 470 470 470 560 680 820 1000	30 × 45 35 × 35 30 × 50 35 × 40 30 × 50 35 × 35 35 × 45 35 × 50 35 × 55 35 × 60 35 × 70	1.42 1.40 1.61 1.59 1.76 1.60 1.82 2.06 2.38 2.73 3.25	B43252A9337M0*# B43252B9337M0*# B43252A9397M0*# B43252B9397M0*# B43252B9477M0*# B43252D9477M0*# B43252A9477M0*# B43252A9567M0*# B43252A9687M0*# B43252A9827M0*# B43252A9108M0*#
450	47 47 56 56 68 68 68 82 82 82 100 100 100 100 120 120 120 120 120	22 × 20 25.4 × 20 22 × 25 25.4 × 20 22 × 30 25.4 × 25 30 × 20 22 × 35 25.4 × 30 30 × 20 22 × 40 25.4 × 30 30 × 25 35 × 20 22 × 45 25.4 × 35 30 × 30 35 × 20 35 × 25	0.34 0.37 0.40 0.41 0.47 0.48 0.49 0.54 0.54 0.54 0.63 0.62 0.64 0.65 0.73 0.72 0.74 0.68 0.76	B43252A5476M0*# B43252B5476M0*# B43252A5566M0*# B43252B5566M0*# B43252A5686M0*# B43252B5686M0*# B43252C5686M0*# B43252A5826M0*# B43252B5826M0*# B43252C5826M0*# B43252A5107M0*# B43252B5107M0*# B43252C5107M0*# B43252D5107M0*# B43252A5127M0*# B43252B5127M0*# B43252C5127M0*# B43252E5127M0*# B43252D5127M0*#

Composition of ordering code

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B43252

Standard series – 105 °C 标准型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
450	150	35 × 20	1.00	B43252E5157M0*#
	150	22 × 50	0.85	B43252A5157M0*#
	150	25.4 × 40	0.85	B43252B5157M0*#
	150	30 × 30	0.83	B43252C5157M0*#
	150	35 × 25	0.85	B43252D5157M0*#
	180	25.4 × 45	0.97	B43252A5187M0*#
	180	30 × 35	0.96	B43252B5187M0*#
	180	35 × 25	0.89	B43252D5187M0*#
	180	35 × 30	0.98	B43252C5187M0*#
	220	25.4 × 50	1.12	B43252A5227M0*#
	220	30 × 40	1.11	B43252B5227M0*#
	220	35 × 30	1.08	B43252C5227M0*#
	270	35 × 35	1.26	B43252B5277M0*#
	270	30 × 45	1.28	B43252A5277M0*#
	330	30 × 50	1.48	B43252A5337M0*#
	330	35 × 40	1.46	B43252B5337M0*#
	390	35 × 45	1.66	B43252A5397M0*#
	470	35 × 50	1.89	B43252A5477M0*#
	560	35 × 50	2.06	B43252A5567M0*#
	680	35 × 60	2.37	B43252A5687M0*#

Composition of ordering code

订货编码的组成

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Long life grade capacitors

长寿命电容器

Applications

应用

- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源



Features

特点

- High ripple current capability
高纹波电流能力
- RoHS-compatible
符合RoHS要求

Construction

结构

- Aluminum case, fully insulated
铝质外壳，全绝缘
- Minus pole marking on the insulating sleeve
绝缘套管标注负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B43254

Long life – 105 °C 长寿命型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

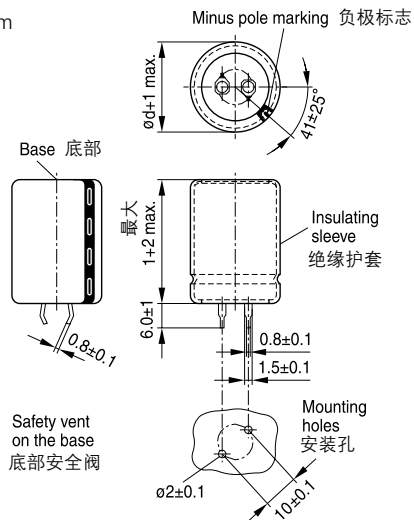
Rated voltage V_R 额定电压 V_R	160 ... 450 V DC				
Surge voltage V_S 浪涌电压 V_S	$1.15 \cdot V_R$ (for $V_R \leq 315$ V DC) $1.10 \cdot V_R$ (for $V_R > 315$ V DC)				
Operating temperature range 工作温度范围	$V_R \leq 250$ V DC : $-40\text{ }^{\circ}\text{C} \dots +105\text{ }^{\circ}\text{C}$ $V_R \geq 300$ V DC : $-25\text{ }^{\circ}\text{C} \dots +105\text{ }^{\circ}\text{C}$				
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	47 ... 2700 μF				
Capacitance tolerance 电容量公差	$\pm 20\%$ M				
Useful life 使用寿命 (105 °C, V_R , $I_{AC,R}$)	3000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit			要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{\text{leak}} \leq$ 最初限值
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{\text{leak}} \leq 3\text{ }\mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{V_R}{V} \right)^{1/2}$				
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	160 ... 400			450
	$\tan \delta$	0.15			0.20
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	160 ... 250	300 ... 315	350 ... 400	450
	$Z(-25\text{ }^{\circ}\text{C})$	4	4	4	8
	$Z(+20\text{ }^{\circ}\text{C})$				
	$Z(-40\text{ }^{\circ}\text{C})$	6			
	$Z(+20\text{ }^{\circ}\text{C})$				
Shelf life 储存寿命	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. 105 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。				
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	0.90	1.00	1.20	1.50	1.55
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C	+70 °C	+85 °C	+105 °C
	2.7	2.5	2.1	1.7	1.0
Sectional specification 分规范	IEC 60384-4				



Dimensional drawings

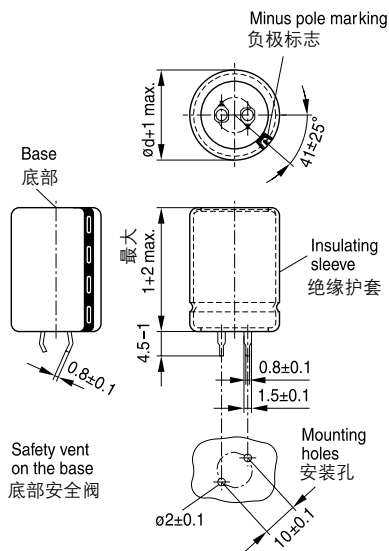
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals ($4.5-1$) mm
焊片式短针脚 ($4.5-1$) mm
digit 15 of part number = 7
订货编码第15位数 = 7



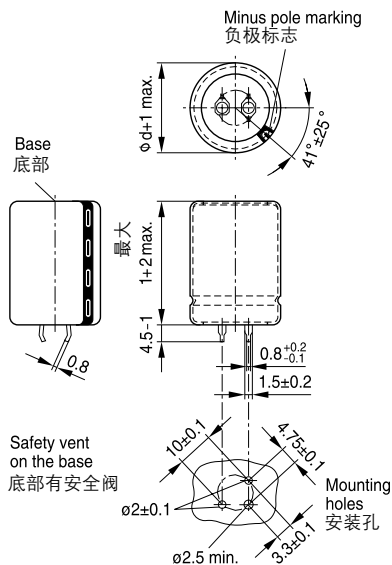
KAL1095-Q-E



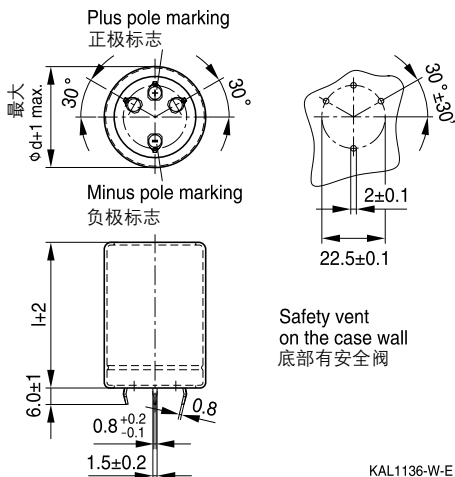
B43254

Long life – 105 °C 长寿命型 – 105 °C

snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2

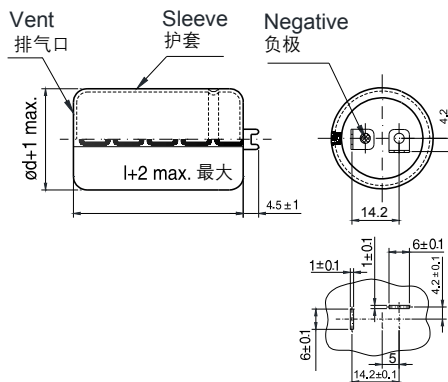


snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



KAL1136-W-E

snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
160	220	22 × 20	0.76	B43254A1227M0*#
	270	22 × 25	0.91	B43254A1277M0*#
	270	25.4 × 20	0.93	B43254B1277M0*#
	330	22 × 25	1.01	B43254A1337M0*#
	330	25.4 × 20	1.03	B43254B1337M0*#
	390	22 × 25	1.09	B43254A1397M0*#
	390	25.4 × 25	1.20	B43254B1397M0*#
	390	30 × 20	1.23	B43254C1397M0*#
	470	22 × 30	1.28	B43254A1477M0*#
	470	25.4 × 25	1.32	B43254B1477M0*#
	470	30 × 20	1.35	B43254C1477M0*#
	560	22 × 35	1.48	B43254A1567M0*#
	560	25.4 × 30	1.53	B43254B1567M0*#
	560	30 × 25	1.57	B43254C1567M0*#
	560	35 × 20	1.60	B43254D1567M0*#
	680	22 × 40	1.72	B43254A1687M0*#
	680	25.4 × 30	1.69	B43254B1687M0*#
	680	30 × 25	1.73	B43254C1687M0*#
	680	35 × 20	1.76	B43254D1687M0*#
	820	22 × 45	1.98	B43254A1827M0*#
	820	25.4 × 35	1.96	B43254B1827M0*#
	820	30 × 30	2.02	B43254C1827M0*#
	820	35 × 25	2.06	B43254D1827M0*#
	1000	22 × 50	2.28	B43254A1108M0*#
	1000	25.4 × 40	2.28	B43254B1108M0*#
	1000	30 × 30	2.23	B43254C1108M0*#
	1000	35 × 25	2.28	B43254D1108M0*#
	1200	25.4 × 45	2.41	B43254A1128M0*#
	1200	30 × 35	2.38	B43254B1128M0*#
	1200	35 × 30	2.44	B43254C1128M0*#

Composition of ordering code

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8 = 抗振性端子(4.5 ± 1 mm)



B43254

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
160	1500	25.4 × 50	2.81	B43254A1158M0*#
	1500	30 × 40	2.79	B43254B1158M0*#
	1500	35 × 30	2.73	B43254C1158M0*#
	1800	30 × 45	3.19	B43254A1188M0*#
	1800	35 × 35	3.14	B43254B1188M0*#
	2200	35 × 50	3.74	B43254C1228M0*#
	2200	30 × 50	3.44	B43254A1228M0*#
	2200	35 × 45	3.55	B43254B1228M0*#
	2700	35 × 50	4.08	B43254A1278M0*#
200	150	22 × 20	0.63	B43254A2157M0*#
	180	22 × 20	0.69	B43254A2187M0*#
	180	25.4 × 20	0.76	B43254B2187M0*#
	220	22 × 25	0.82	B43254A2227M0*#
	220	25.4 × 20	0.84	B43254B2227M0*#
	270	22 × 25	0.91	B43254A2277M0*#
	270	25.4 × 25	1.00	B43254B2277M0*#
	270	30 × 20	1.02	B43254C2277M0*#
	330	22 × 30	1.07	B43254A2337M0*#
	330	25.4 × 25	1.11	B43254B2337M0*#
	330	30 × 20	1.13	B43254C2337M0*#
	390	22 × 30	1.17	B43254A2397M0*#
	390	25.4 × 25	1.20	B43254B2397M0*#
	390	30 × 25	1.31	B43254C2397M0*#
	390	35 × 20	1.34	B43254D2397M0*#
	470	22 × 35	1.36	B43254A2477M0*#
	470	25.4 × 30	1.40	B43254B2477M0*#
	470	30 × 25	1.44	B43254C2477M0*#
	470	35 × 20	1.47	B43254D2477M0*#
	560	22 × 40	1.56	B43254A2567M0*#
	560	25.4 × 30	1.53	B43254B2567M0*#
	560	30 × 25	1.57	B43254C2567M0*#
	560	35 × 25	1.70	B43254D2567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style

0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
200	680	22 × 45	1.80	B43254A2687M0*#
	680	25.4 × 35	1.79	B43254B2687M0*#
	680	30 × 30	1.84	B43254C2687M0*#
	680	35 × 25	1.88	B43254D2687M0*#
	820	25.4 × 45	2.16	B43254A2827M0*#
	820	30 × 30	2.02	B43254B2827M0*#
	820	35 × 25	2.06	B43254C2827M0*#
	1000	25.4 × 50	2.48	B43254A2108M0*#
	1000	30 × 35	2.35	B43254B2108M0*#
	1000	35 × 30	2.41	B43254C2108M0*#
	1200	30 × 40	2.50	B43254A2128M0*#
	1200	35 × 35	2.57	B43254B2128M0*#
	1500	30 × 50	3.04	B43254A2158M0*#
	1500	35 × 40	3.00	B43254B2158M0*#
	1800	35 × 45	3.43	B43254A2188M0*#
	2200	35 × 50	3.68	B43254A2228M0*#
250	120	22 × 20	0.56	B43254E2127M0*#
	150	22 × 25	0.68	B43254E2157M0*#
	150	25.4 × 20	0.69	B43254F2157M0*#
	180	22 × 25	0.74	B43254E2187M0*#
	180	25.4 × 20	0.76	B43254F2187M0*#
	220	22 × 25	0.82	B43254E2227M0*#
	220	25.4 × 25	0.90	B43254F2227M0*#
	220	30 × 20	0.92	B43254C2227M0*#
	270	22 × 30	0.97	B43254E2277M0*#
	270	25.4 × 25	1.00	B43254F2277M0*#
	270	30 × 20	1.02	B43254G2277M0*#
	330	22 × 35	1.14	B43254E2337M0*#
	330	25.4 × 30	1.18	B43254F2337M0*#
	330	30 × 25	1.21	B43254G2337M0*#
	330	35 × 20	1.23	B43254D2337M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
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* = 绝缘特征
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8 = vibration-resistance terminals (4.5 ± 1 mm)

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8 = 抗振性端子(4.5 ± 1 mm)



B43254

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
250	390	22 × 40	1.30	B43254E2397M0*#
	390	25.4 × 35	1.35	B43254F2397M0*#
	390	30 × 25	1.31	B43254G2397M0*#
	390	35 × 25	1.42	B43254H2397M0*#
	470	22 × 45	1.50	B43254E2477M0*#
	470	25.4 × 35	1.48	B43254F2477M0*#
	470	30 × 30	1.53	B43254G2477M0*#
	470	35 × 25	1.56	B43254H2477M0*#
	560	22 × 50	1.71	B43254E2567M0*#
	560	25.4 × 40	1.70	B43254F2567M0*#
	560	30 × 30	1.67	B43254G2567M0*#
	560	35 × 25	1.70	B43254H2567M0*#
	680	25.4 × 50	2.05	B43254E2687M0*#
	680	30 × 35	1.94	B43254F2687M0*#
	680	35 × 30	1.98	B43254G2687M0*#
	820	30 × 40	2.23	B43254E2827M0*#
	820	35 × 35	2.29	B43254F2827M0*#
	1000	30 × 50	2.68	B43254E2108M0*#
	1000	35 × 40	2.65	B43254F2108M0*#
	1200	30 × 60	2.92	B43254E2128M0*#
	1200	35 × 45	2.80	B43254F2128M0*#
	1500	35 × 50	3.25	B43254E2158M0*#
350	56	22 × 20	0.37	B43254A4566M0*#
	68	22 × 20	0.41	B43254A4686M0*#
	68	25.4 × 20	0.45	B43254B4686M0*#
	82	22 × 25	0.48	B43254A4826M0*#
	82	25.4 × 20	0.49	B43254B4826M0*#
	100	22 × 25	0.53	B43254A4107M0*#
	100	25.4 × 25	0.58	B43254B4107M0*#
	100	30 × 20	0.60	B43254C4107M0*#
	120	22 × 30	0.62	B43254A4127M0*#
	120	25.4 × 25	0.64	B43254B4127M0*#
	120	30 × 20	0.65	B43254C4127M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
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7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
350	150	22 × 35	0.74	B43254A4157M0*#
	150	25.4 × 30	0.76	B43254B4157M0*#
	150	30 × 25	0.78	B43254C4157M0*#
	150	35 × 20	0.80	B43254D4157M0*#
	180	22 × 40	0.85	B43254A4187M0*#
	180	25.4 × 30	0.83	B43254B4187M0*#
	180	30 × 25	0.86	B43254C4187M0*#
	180	35 × 20	0.87	B43254D4187M0*#
	220	22 × 45	0.98	B43254A4227M0*#
	220	25.4 × 35	0.98	B43254B4227M0*#
	220	30 × 30	1.00	B43254C4227M0*#
	220	35 × 25	1.03	B43254D4227M0*#
	270	22 × 50	1.14	B43254A4277M0*#
	270	25.4 × 40	1.14	B43254B4277M0*#
	270	30 × 30	1.11	B43254C4277M0*#
	270	35 × 25	1.14	B43254D4277M0*#
	330	25.4 × 45	1.31	B43254A4337M0*#
	330	30 × 35	1.30	B43254B4337M0*#
	330	35 × 30	1.33	B43254C4337M0*#
	390	25.4 × 50	1.49	B43254A4397M0*#
	390	30 × 40	1.48	B43254B4397M0*#
	390	35 × 35	1.52	B43254C4397M0*#
	470	30 × 45	1.69	B43254A4477M0*#
	470	35 × 35	1.67	B43254B4477M0*#
	560	30 × 50	1.92	B43254A4567M0*#
	560	35 × 40	1.90	B43254B4567M0*#
	680	35 × 50	2.27	B43254A4687M0*#
400	47	22 × 20	0.34	B43254A9476M0*#
	56	22 × 20	0.37	B43254A9566M0*#
	56	25.4 × 20	0.41	B43254B9566M0*#
	68	22 × 25	0.44	B43254A9686M0*#
	68	25.4 × 20	0.45	B43254B9686M0*#

Composition of ordering code

订货编码的组成

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* = 绝缘特征
0 = PVC绝缘
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0 = snap - in standard terminals (6.0 ± 1 mm)
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0 = 焊片式标准端子(6.0 ± 1 mm)
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B43254

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
400	82	22 × 25	0.48	B43254A9826M0*#
	82	25.4 × 25	0.53	B43254B9826M0*#
	82	30 × 20	0.54	B43254C9826M0*#
	100	22 × 30	0.57	B43254A9107M0*#
	100	25.4 × 25	0.58	B43254B9107M0*#
	100	30 × 20	0.60	B43254C9107M0*#
	120	22 × 35	0.66	B43254A9127M0*#
	120	25.4 × 25	0.64	B43254B9127M0*#
	120	30 × 25	0.70	B43254C9127M0*#
	120	35 × 20	0.71	B43254D9127M0*#
	150	22 × 40	0.78	B43254A9157M0*#
	150	25.4 × 30	0.76	B43254B9157M0*#
	150	30 × 25	0.78	B43254C9157M0*#
	150	35 × 20	0.80	B43254D9157M0*#
	180	22 × 45	0.89	B43254A9187M0*#
	180	25.4 × 35	0.88	B43254B9187M0*#
	180	30 × 30	0.91	B43254C9187M0*#
	180	35 × 25	0.93	B43254D9187M0*#
	220	22 × 50	1.03	B43254A9227M0*#
	220	25.4 × 40	1.03	B43254B9227M0*#
	220	30 × 30	1.00	B43254C9227M0*#
	220	35 × 25	1.03	B43254D9227M0*#
	270	25.4 × 45	1.19	B43254A9277M0*#
	270	25.4 × 35	1.17	B43254B9277M0*#
	270	35 × 30	1.20	B43254C9277M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
7 = snap - in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
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8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
400	330	25.4 × 50	1.37	B43254A9337M0*#
	330	25.4 × 40	1.36	B43254B9337M0*#
	330	35 × 30	1.33	B43254C9337M0*#
	390	30 × 45	1.54	B43254A9397M0*#
	390	35 × 35	1.52	B43254B9397M0*#
	470	30 × 50	1.76	B43254A9477M0*#
	470	35 × 40	1.74	B43254B9477M0*#
	560	35 × 45	1.98	B43254A9567M0*#
	680	35 × 50	2.27	B43254A9687M0*#
	820	35 × 60	2.70	B43254A9827M0*#
450	56	22 × 25	0.29	B43254A5566M0*#
	68	22 × 30	0.34	B43254A5686M0*#
	68	25.4 × 25	0.35	B43254B5686M0*#
	82	22 × 30	0.38	B43254A5826M0*#
	82	25.4 × 25	0.39	B43254B5826M0*#
	82	30 × 20	0.39	B43254C5826M0*#
	100	22 × 35	0.44	B43254A5107M0*#
	100	25.4 × 30	0.46	B43254B5107M0*#
	100	30 × 25	0.47	B43254C5107M0*#
	120	22 × 40	0.51	B43254A5127M0*#
	120	25.4 × 30	0.50	B43254B5127M0*#
	120	30 × 25	0.51	B43254C5127M0*#
	120	35 × 25	0.56	B43254D5127M0*#
	150	22 × 45	0.60	B43254A5157M0*#
	150	25.4 × 40	0.62	B43254B5157M0*#
	150	30 × 30	0.61	B43254C5157M0*#
	150	35 × 25	0.62	B43254D5157M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap - in standard terminals (6.0 ± 1 mm)
2 = snap - in 3 terminals (4.5 - 1 mm)
4 = snap - in 4 terminals (6.0 ± 1 mm)
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8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
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7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43254

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
450	180	22 × 50	0.68	B43254A5187M0*#
	180	25.4 × 40	0.68	B43254B5187M0*#
	180	30 × 30	0.67	B43254C5187M0*#
	180	35 × 25	0.68	B43254D5187M0*#
	220	25.4 × 50	0.79	B43254A5227M0*#
	220	30 × 35	0.78	B43254B5227M0*#
	220	35 × 25	0.75	B43254C5227M0*#
	270	30 × 40	0.90	B43254A5277M0*#
	270	35 × 30	0.88	B43254B5277M0*#
	330	30 × 45	1.04	B43254A5337M0*#
	330	35 × 35	1.03	B43254B5337M0*#
	390	30 × 50	1.18	B43254A5397M0*#
	390	35 × 40	1.17	B43254B5397M0*#
	470	35 × 45	1.34	B43254A5477M0*#
	560	35 × 50	1.52	B43254A5567M0*#

Composition of ordering code

订货编码的组成

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8 = 抗振性端子(4.5 ± 1 mm)

Long life grade capacitors

长寿级电容器

Applications

应用

- Frequency converters
变频器
- Professional power supplies
专用电源



Features

特点

- High reliability
可靠性高
- High CV product
高CV产品
- RoHS-compatible
符合RoHS要求

Construction

结构

- Aluminum case, fully insulated
铝质外壳，全绝缘
- Snap-in solder pins to hold component in place on PC-board
采用焊片式焊脚在印刷电路板上固定元件
- Minus pole marking on the insulating sleeve
绝缘套管标注负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B43255

Long life – 105 °C 长寿型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

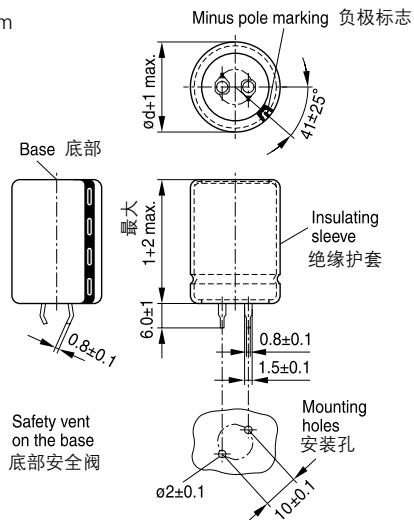
Rated voltage V_R 额定电压 V_R	200 ... 450 V DC			
Surge voltage V_S 浪涌电压 V_S	$1.15 \cdot V_R$ (for $V_R \leq 315$ V DC) $1.10 \cdot V_R$ (for $V_R > 315$ V DC)			
Operating temperature range 工作温度范围	$V_R \leq 400$ V DC : -40 °C ... $+105$ °C $V_R \geq 450$ V DC : -25 °C ... $+105$ °C			
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	47 ... 1500 μ F			
Capacitance tolerance 电容量公差	$\pm 20\%$ M			
Useful life 使用寿命 (105 °C, V_R , $I_{AC,R}$)	5000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit		要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{leak} \leq$ 最初限值
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.02 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)$			
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	200 ... 400		450
	$\tan \delta$	0.15		0.20
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	200 ... 250	315 ... 400	500
	$Z(-25$ °C)	4	4	8
	$Z(+20$ °C)			
	$Z(-40$ °C)	6	8	
	$Z(+20$ °C)			
Shelf life 储存寿命	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. 105 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。			
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	50 Hz	120 Hz	1 kHz	10 kHz
	0.90	1.00	1.20	1.50
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	+40 °C	+55 °C	+70 °C	+85 °C
	2.7	2.5	2.1	1.7
Sectional specification 分规范	IEC 60384-4			



Dimensional drawings

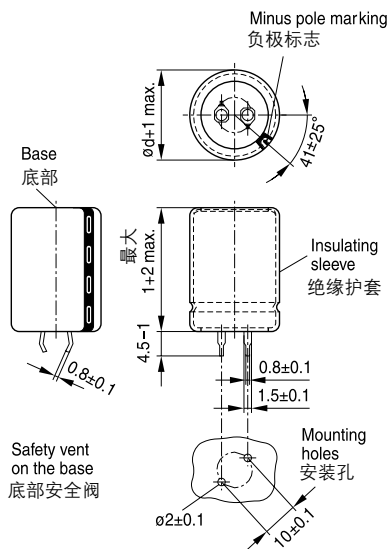
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals ($4.5-1$) mm
焊片式短针脚 ($4.5-1$) mm
digit 15 of part number = 7
订货编码第15位数 = 7



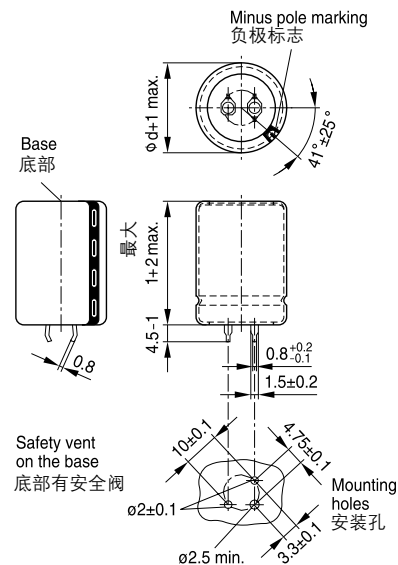
KAL1095-Q-E



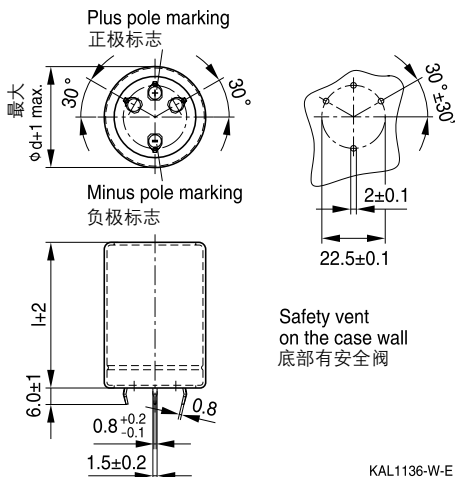
B43255

Long life – 105 °C 长寿命型 – 105 °C

snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2

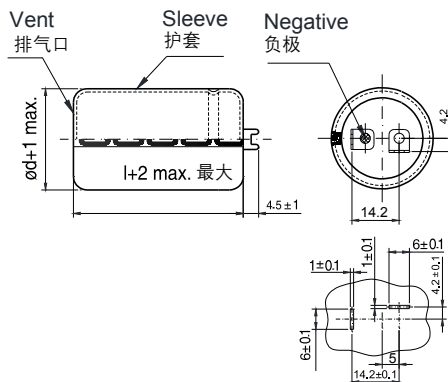


snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



KAL1136-W-E

snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{A,C,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
200	220	22 × 25	0.82	B43255A2227M0*#
	270	25.4 × 25	1.00	B43255A2277M0*#
	330	25.4 × 30	1.18	B43255A2337M0*#
	390	25.4 × 35	1.35	B43255A2397M0*#
	470	25.4 × 40	1.56	B43255A2477M0*#
	560	30 × 35	1.76	B43255A2567M0*#
	680	30 × 40	2.03	B43255A2687M0*#
	820	35 × 35	2.29	B43255A2827M0*#
	1000	35 × 35	2.53	B43255A2108M0*#
	1200	35 × 40	2.69	B43255A2128M0*#
	1500	35 × 50	3.25	B43255A2158M0*#
250	150	22 × 25	0.68	B43255E2157M0*#
	180	22 × 30	0.79	B43255E2187M0*#
	220	25.4 × 30	0.96	B43255E2227M0*#
	270	25.4 × 35	1.13	B43255E2277M0*#
	270	30 × 25	1.03	B43255F2277M0*#
	330	30 × 30	1.28	B43255E2337M0*#
	390	30 × 35	1.47	B43255E2397M0*#
	470	35 × 30	1.65	B43255E2477M0*#
	560	35 × 35	1.89	B43255E2567M0*#
	680	35 × 40	2.18	B43255E2687M0*#
	820	35 × 45	2.50	B43255E2827M0*#
	1000	35 × 50	2.87	B43255E2108M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0=PVC绝缘
6=PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

#= 端子类型

0=焊片式标准端子(6.0 ± 1 mm)
2=焊片式3端子(4.5 -1 mm)
4=焊片式4端子(6.0 ± 1 mm)
7=焊片式短端子(4.5 -1 mm)
8=抗振性端子(4.5 ± 1 mm)



B43255

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C	Ordering code 订货编码
V DC	μF		A	
315	82	22 × 25	0.48	B43255A0826M0*#
	100	22 × 30	0.57	B43255A0107M0*#
	120	25.4 × 25	0.64	B43255A0127M0*#
	150	30 × 25	0.78	B43255A0157M0*#
	180	30 × 25	0.86	B43255A0187M0*#
	220	30 × 30	1.00	B43255A0227M0*#
	270	35 × 30	1.20	B43255A0277M0*#
	330	35 × 30	1.33	B43255A0337M0*#
	390	35 × 35	1.52	B43255A0397M0*#
	470	35 × 40	1.74	B43255A0477M0*#
350	560	35 × 45	1.98	B43255A0567M0*#
	680	35 × 50	2.27	B43255A0687M0*#
	82	22 × 25	0.48	B43255A4826M0*#
	100	25.4 × 25	0.59	B43255A4107M0*#
	120	25.4 × 30	0.68	B43255A4127M0*#
	150	25.4 × 30	0.76	B43255A4157M0*#
	180	25.4 × 35	0.88	B43255A4187M0*#
	220	30 × 35	1.06	B43255A4227M0*#
	270	30 × 40	1.23	B43255A4277M0*#
	330	35 × 35	1.40	B43255A4337M0*#
	390	35 × 40	1.59	B43255A4397M0*#
	470	35 × 45	1.82	B43255A4477M0*#
	560	35 × 50	2.06	B43255A4567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0=PVC绝缘
6=PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0=焊片式标准端子(6.0 ± 1 mm)
2=焊片式3端子(4.5 -1 mm)
4=焊片式4端子(6.0 ± 1 mm)
7=焊片式短端子(4.5 -1 mm)
8=抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{A,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
400	56	22 × 25	0.40	B43255A9566M0*#
	68	25.4 × 25	0.48	B43255A9686M0*#
	82	25.4 × 25	0.53	B43255A9826M0*#
	100	25.4 × 30	0.62	B43255A9107M0*#
	120	30 × 25	0.70	B43255A9127M0*#
	150	30 × 30	0.83	B43255A9157M0*#
	180	35 × 30	0.98	B43255A9187M0*#
	220	35 × 30	1.08	B43255A9227M0*#
	270	35 × 35	1.26	B43255A9277M0*#
	330	35 × 40	1.46	B43255A9337M0*#
	390	35 × 45	1.66	B43255A9397M0*#
	470	35 × 50	1.89	B43255A9477M0*#
	560	35 × 60	2.23	B43255A9567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0=PVC绝缘
6=PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

#= 端子类型

0=焊片式标准端子(6.0 ± 1 mm)
2=焊片式3端子(4.5 -1 mm)
4=焊片式4端子(6.0 ± 1 mm)
7=焊片式短端子(4.5 -1 mm)
8=抗振性端子(4.5 ± 1 mm)



B43255

Long life – 105 °C 长寿命型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C	Ordering code 订货编码
V DC	μF		A	
450	47	22 × 30	0.39	B43255A5476M0*#
	56	25.4 × 25	0.44	B43255A5566M0*#
	68	25.4 × 30	0.51	B43255A5686M0*#
	82	30 × 30	0.61	B43255A5826M0*#
	100	30 × 30	0.68	B43255A5107M0*#
	100	35 × 25	0.67	B43255B5107M0*#
	120	30 × 25	0.67	B43255B5127M0*#
	120	30 × 30	0.74	B43255A5127M0*#
	150	25.4 × 45	0.92	B43255B5157M0*#
	150	35 × 25	0.82	B43255C5157M0*#
	150	35 × 30	0.90	B43255A5157M0*#
	180	35 × 30	0.95	B43255B5187M0*#
	180	35 × 35	1.03	B43255A5187M0*#
	220	30 × 45	1.22	B43255B5227M000
	220	35 × 35	1.11	B43255C5227M0*#
	220	35 × 40	1.19	B43255A5227M0*#
	270	35 × 35	1.22	B43255B5277M0*#
	270	35 × 45	1.38	B43255A5277M0*#
	330	35 × 40	1.41	B43255B5337M000
	330	35 × 50	1.58	B43255A5337M0*#
	390	35 × 50	1.71	B43255A5397M0*#
	470	35 × 50	1.88	B43255A5477M0*#
	680	35 × 70	2.68	B43255A5687M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0=PVC绝缘
6=PET绝缘

= Terminal style

0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 -1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 -1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0=焊片式标准端子(6.0 ± 1 mm)
2=焊片式3端子(4.5 -1 mm)
4=焊片式4端子(6.0 ± 1 mm)
7=焊片式短端子(4.5 -1 mm)
8=抗振性端子(4.5 ± 1 mm)

Long life grade capacitors

长寿级电容器

Applications

应用

- Professional power supplies
专用电源
- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源



Features

特点

- High ripple current capability
耐高纹波电流能力
- Compact size
结构紧凑
- High reliability
可靠性高
- RoHS-compatible
符合RoHS要求

Construction

结构

- Aluminum case, fully insulated
铝质外壳，整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管标注负极
- Overload protection by safety vent on the base
底部安全阀过载保护



B43256

High ripple current – 105 °C 高纹波电流型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

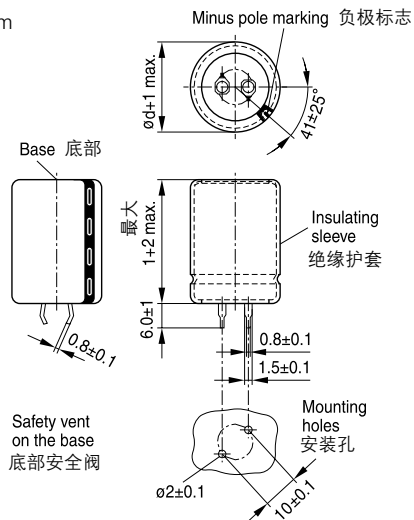
Rated voltage V_R 额定电压 V_R	160 ... 450 V DC						
Surge voltage V_S 浪涌电压 V_S	$1.15 \cdot V_R$ (for $V_R \leq 315$ V DC) $1.10 \cdot V_R$ (for $V_R > 315$ V DC)						
Operating temperaturerange 工作温度范围	$V_R \leq 250$ V DC: -40 °C ... $+105$ °C $V_R \geq 350$ V DC: -25 °C ... $+105$ °C						
Rated capacitance C_R 额定电容量 C_R (20 °C, 120 Hz)	82 ... 3300 μ F						
Capacitance tolerance 电容量公差	$\pm 20\%$ M						
Useful life 使用寿命 (85 °C, V_R , $I_{AC,R}$)	3000 h	Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit				要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{leak} \leq$ 最初限值	
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{1/2}$						
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	160 ... 400			450		
	$\tan \delta$	0.15			0.20		
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	160 ... 250			350 ... 450		
	$Z(-25$ °C)	4			8		
	$Z(+20$ °C)						
	$Z(-40$ °C)	8					
	$Z(+20$ °C)						
Shelf life 储存寿命	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. 105 °C高温贮存1000小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电30分钟, 恢复24至48小时后再测试。						
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	V_R (V DC)	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz	50 kHz
	160 ... 250	0.81	1.00	1.17	1.32	1.45	1.50
	350 ... 450	0.77	1.00	1.16	1.30	1.41	1.43
Frequency multiplier for rated ripple current 额定纹波电流的频率系数	40 °C	55 °C		75 °C		85 °C	105 °C
	2.7	2.5		2.1		1.7	1.0
Sectional specification 分规范	IEC 60384-4						



Dimensional drawings

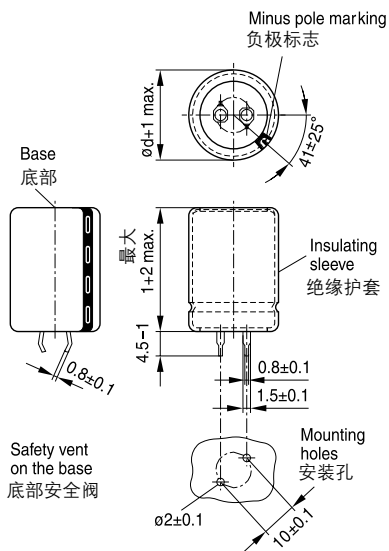
尺寸图

snap-in standard terminals (6.0 ± 1) mm
焊片式标准针脚 (6.0 ± 1) mm
digit 15 of part number = 0
订货编码第15位数 = 0



KAL1095-Q-E

snap-in short terminals (4.5-1) mm
焊片式短针脚 (4.5-1) mm
digit 15 of part number = 7
订货编码第15位数 = 7



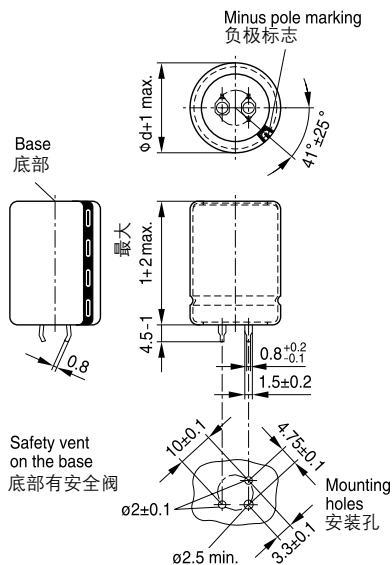
KAL1095-Q-E



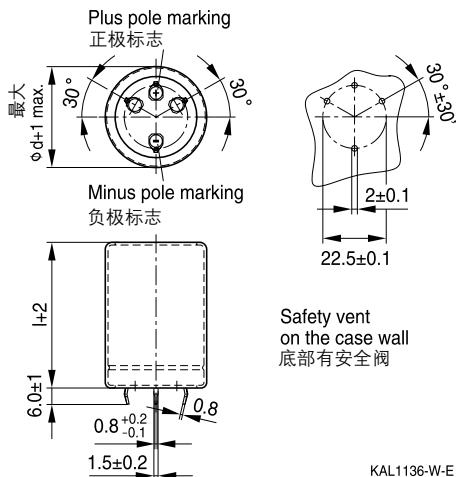
B43256

High ripple current – 105 °C 高纹波电流型 – 105 °C

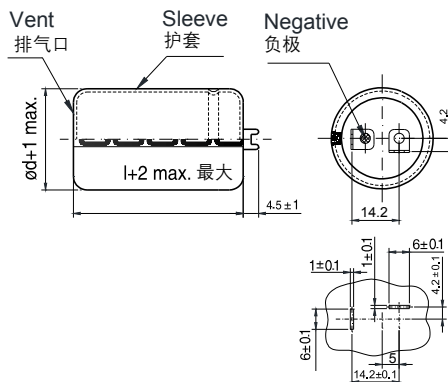
snap-in 3 terminals (4.5-1) mm
焊片式3针脚 (4.5-1) mm
digit 15 of part number = 2
订货编码第15位数 = 2



snap-in 4 terminals (6.0 ± 1) mm
焊片式4针脚 (6.0 ± 1) mm
digit 15 of part number = 4
订货编码第15位数 = 4



snap-in vibration-resistance terminals
焊片式防振针脚
digit 15 of part number = 8
订货编码第15位数 = 8





Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
160	470	22 × 25	1.40	B43256A1477M0*#
	560	22 × 30	1.50	B43256A1567M0*#
	680	22 × 35	1.70	B43256A1687M0*#
	820	25.4 × 30	2.0	B43256B1827M0*#
	820	30 × 25	2.0	B43256C1827M0*#
	1000	22 × 45	2.20	B43256A1108M0*#
	1000	25.4 × 35	2.20	B43256B1108M0*#
	1200	25.4 × 40	2.30	B43256A1128M0*#
	1200	30 × 30	2.30	B43256B1128M0*#
	1200	35 × 25	2.30	B43256C1128M0*#
	1500	25.4 × 45	2.50	B43256A1158M0*#
	1500	30 × 35	2.50	B43256B1158M0*#
	1500	35 × 30	2.50	B43256C1158M0*#
	1800	30 × 40	2.70	B43256A1188M0*#
	1800	35 × 35	2.70	B43256B1188M0*#
	2200	30 × 45	2.90	B43256A1228M0*#
	2200	35 × 35	2.90	B43256B1228M0*#
	2700	35 × 45	3.10	B43256A1278M0*#
	3300	35 × 50	3.30	B43256A1338M0*#
200	270	22 × 25	1.04	B43256A2277M0*#
	330	22 × 25	1.20	B43256A2337M0*#
	390	22 × 30	1.31	B43256D2397M0*#
	470	22 × 30	1.48	B43256A2477M0*#
	470	25.4 × 25	1.48	B43256B2477M0*#
	560	22 × 35	1.60	B43256A2567M0*#
	680	22 × 40	1.75	B43256A2687M0*#
	680	25 × 30	1.75	B43256B2687M0*#
	680	30 × 25	1.75	B43256C2687M0*#
	820	22 × 45	2.04	B43256A2827M0*#
	820	25.4 × 35	2.04	B43256B2827M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43256

High ripple current – 105 °C 高纹波电流型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
200	1000	22 × 50	2.30	B43256A2108M0*#
	1000	25.4 × 45	2.30	B43256B2108M0*#
	1000	35 × 25	2.30	B43256D2108M0*#
	1000	30 × 30	2.30	B43256C2108M0*#
	1200	25.4 × 50	2.65	B43256A2128M0*#
	1200	30 × 35	2.65	B43256B2128M0*#
	1200	35 × 30	2.65	B43256C2128M0*#
	1500	35 × 35	2.80	B43256B2158M0*#
	1500	30 × 40	2.80	B43256A2158M0*#
	1800	30 × 50	3.08	B43256A2188M0*#
	1800	35 × 40	3.08	B43256B2188M0*#
	2200	35 × 50	3.67	B43256A2228M0*#
220	270	22 × 25	1.08	B43256A0277M0*#
	330	22 × 30	1.26	B43256B0337M0*#
	390	22 × 30	1.34	B43256A0397M0*#
	390	25.4 × 25	1.34	B43256B0397M0*#
	470	22 × 35	1.48	B43256A0477M0*#
	560	22 × 40	1.61	B43256A0567M0*#
	560	25.4 × 35	1.61	B43256B0567M0*#
	560	30 × 25	1.61	B43256C0567M0*#
	680	22 × 45	1.78	B43256A0687M0*#
	680	25.4 × 35	1.78	B43256B0687M0*#
	680	30 × 30	1.78	B43256C0687M0*#
	820	22 × 50	1.93	B43256A0827M0*#
	820	25.4 × 40	1.93	B43256B0827M0*#
	820	30 × 35	1.93	B43256C0827M0*#
	820	35 × 25	1.93	B43256D0827M0*#
	1000	25.4 × 50	2.33	B43256A0108M0*#
	1000	30 × 35	2.33	B43256B0108M0*#
	1000	35 × 30	2.33	B43256C0108M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
220	1200	30 × 40	2.50	B43256A0128M0*#
	1200	35 × 35	2.50	B43256B0128M0*#
	1500	30 × 50	2.76	B43256A0158M0*#
	1500	35 × 40	2.76	B43256B0158M0*#
	1800	35 × 50	3.11	B43256A0188M0*#
250	220	22 × 25	1.00	B43256A2227M0*#
	270	22 × 30	1.10	B43256C2227M0*#
	330	22 × 30	1.20	B43256B2337M0*#
	330	25.4 × 25	1.20	B43256C2337M0*#
	390	22 × 35	1.30	B43256B2397M0*#
	390	25.4 × 30	1.30	B43256C2397M0*#
	470	22 × 40	1.40	B43256C2477M0*#
	470	25.4 × 35	1.40	B43256D2477M0*#
	470	30 × 25	1.40	B43256E2477M0*#
	560	22 × 45	1.50	B43256B2567M0*#
	560	25.4 × 35	1.50	B43256C2567M0*#
	560	30 × 30	1.50	B43256D2567M0*#
	680	25.4 × 40	1.70	B43256E2687M0*#
	680	35 × 25	1.70	B43256G2687M0*#
	820	25.4 × 45	2.00	B43256C2827M0*#
	820	30 × 35	2.00	B43256D2827M0*#
	820	35 × 30	2.00	B43256E2827M0*#
	1000	30 × 40	2.20	B43256E2108M0*#
	1000	35 × 35	2.20	B43256F2108M0*#
	1200	35 × 40	2.30	B43256E2128M0*#
	1500	35 × 45	2.50	B43256C2158M0*#
	1800	35 × 50	2.70	B43256C2188M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



B43256

High ripple current – 105 °C 高纹波电流型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
350	120	22 × 25	0.75	B43256A4127M0*#
	150	22 × 30	0.82	B43256A4157M0*#
	180	22 × 30	0.90	B43256A4187M0*#
	180	25.4 × 25	0.90	B43256B4187M0*#
	220	22 × 35	1.00	B43256A4227M0*#
	220	25.4 × 30	1.00	B43256B4227M0*#
	270	22 × 40	1.10	B43256A4277M0*#
	270	25.4 × 35	1.10	B43256B4277M0*#
	270	30 × 25	1.10	B43256C4277M0*#
	330	22 × 45	1.20	B43256A4337M0*#
	330	25.4 × 40	1.20	B43256B4337M0*#
	330	30 × 30	1.20	B43256C4337M0*#
	390	25.4 × 45	1.30	B43256A4397M0*#
	390	30 × 35	1.30	B43256B4397M0*#
	470	25.4 × 50	1.40	B43256A4477M0*#
	470	30 × 40	1.40	B43256B4477M0*#
	470	35 × 30	1.40	B43256C4477M0*#
	560	30 × 45	1.50	B43256A4567M0*#
	560	35 × 35	1.50	B43256B4567M0*#
	680	30 × 50	1.70	B43256A4687M0*#
	680	35 × 40	1.70	B43256B4687M0*#
	820	35 × 45	1.90	B43256A4827M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
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* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.0 ± 1 mm)
2 = snap-in 3 terminals (4.5 - 1 mm)
4 = snap-in 4 terminals (6.0 ± 1 mm)
7 = snap-in short terminals (4.5 - 1 mm)
8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型
0 = 焊片式标准端子(6.0 ± 1 mm)
2 = 焊片式3端子(4.5 - 1 mm)
4 = 焊片式4端子(6.0 ± 1 mm)
7 = 焊片式短端子(4.5 - 1 mm)
8 = 抗振性端子(4.5 ± 1 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 $d \times l$ mm	$I_{AC,R}$ 120 Hz, 105 °C A	Ordering code 订货编码
V DC	μF			
400	100	22 × 25	0.68	B43256A9107M0*#
	120	22 × 30	0.73	B43256A9127M0*#
	150	22 × 35	0.85	B43256A9157M0*#
	180	22 × 35	0.95	B43256A9187M0*#
	180	25.4 × 30	0.95	B43256B9187M0*#
	180	30 × 25	0.95	B43256C9187M0*#
	220	22 × 45	1.10	B43256A9227M0*#
	220	25.4 × 35	1.10	B43256B9227M0*#
	220	30 × 25	1.10	B43256C9227M0*#
	270	22 × 50	1.22	B43256A9277M0*#
	270	25.4 × 40	1.22	B43256B9277M0*#
	270	30 × 30	1.22	B43256C9277M0*#
	270	35 × 25	1.22	B43256D9277M0*#
	330	25.4 × 45	1.44	B43256A9337M0*#
	330	30 × 35	1.44	B43256B9337M0*#
	390	25.4 × 50	1.55	B43256A9397M0*#
	390	30 × 40	1.55	B43256B9397M0*#
	390	35 × 30	1.55	B43256C9397M0*#
	390	35 × 35	1.60	B43256D9397M0*#
	470	30 × 45	1.68	B43256A9477M0*#
	470	35 × 35	1.68	B43256B9477M0*#
	560	30 × 50	1.90	B43256A9567M0*#
	560	35 × 40	1.90	B43256B9567M0*#
	680	35 × 45	2.12	B43256A9687M0*#

Composition of ordering code

订货编码的组成

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0 = PVC insulation
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* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

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8 = vibration-resistance terminals (4.5 ± 1 mm)

= 端子类型

0 = 焊片式标准端子(6.0 ± 1 mm)

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4 = 焊片式4端子(6.0 ± 1 mm)

7 = 焊片式短端子(4.5 - 1 mm)

8 = 抗振性端子(4.5 ± 1 mm)



B43256

High ripple current – 105 °C 高纹波电流型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz, 20 °C	Case dimensions 外壳尺寸 d × l mm	$I_{AC,R}$ 120 Hz, 105 °C	Ordering code 订货编码
V DC	μF		A	
450	82	22 × 25	0.64	B43256A5826M0*#
	100	22 × 30	0.69	B43256A5107M0*#
	100	25.4 × 25	0.69	B43256B5107M0*#
	120	22 × 35	0.72	B43256A5127M0*#
	120	25.4 × 30	0.72	B43256B5127M0*#
	150	22 × 40	0.79	B43256A5157M0*#
	150	25.4 × 30	0.79	B43256B5157M0*#
	150	30 × 25	0.79	B43256C5157M0*#
	180	22 × 45	0.87	B43256A5187M0*#
	180	25.4 × 35	0.87	B43256B5187M0*#
	180	30 × 30	0.87	B43256C5187M0*#
	220	25.4 × 40	1.05	B43256A5227M0*#
	220	30 × 30	1.05	B43256B5227M0*#
	220	35 × 25	1.05	B43256C5227M0*#
	270	25.4 × 50	1.23	B43256A5277M0*#
	270	30 × 35	1.23	B43256B5277M0*#
	270	35 × 30	1.23	B43256C5277M0*#
	330	30 × 40	1.38	B43256A5337M0*#
	330	35 × 35	1.38	B43256B5337M0*#
	390	30 × 50	1.61	B43256A5397M0*#
	390	35 × 40	1.61	B43256B5397M0*#
	470	35 × 45	1.78	B43256A5477M0*#
	560	35 × 50	1.99	B43256A5567M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation

* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

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0 = 焊片式标准端子(6.0 ± 1 mm)
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8 = 抗振性端子(4.5 ± 1 mm)

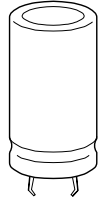
Long-life grade capacitors

长使用寿命级电容器

Applications

应用

- Frequency converters
变频器
- Professional power supplies
专业电源
- Switch-mode power supplies in industrial and entertainment electronics
工业和消费电子产品中的开关电源



Features

特点

- ultra compact
体积小型
- High reliability
高可靠性
- High ripple current capability
耐高纹波电流
- RoHS-compatible
符合RoHS要求

Construction

结构

- Charge/discharge-proof, polar
可充放电, 有极性
- Aluminum case, fully insulated
铝制外壳, 整体绝缘
- Minus pole marking on the insulating sleeve
绝缘套管标注负极
- Overload protection by safety vent on the base
底部的安全阀过载保护功能



B43508

Ultra compact – 105 °C 体积小型 – 105 °C

Specifications and characteristics in brief

规格性能参数一览表

Rated voltage V_R 额定电压 V_R	200 ... 450 V DC					
Surge voltage V_S 浪涌电压 V_S	$1.15 \times V_R$ (for $V_R \leq 250$ V DC) $1.10 \times V_R$ (for $V_R \geq 400$ V DC)					
Operating temperature range 工作温度范围	$V_R \leq 250$ V DC : -40 °C ... $+105$ °C $V_R \geq 400$ V DC : -25 °C ... $+105$ °C					
Rated capacitance C_R (额定电容量 C_R 20 °C, 120 Hz)	82 ... 2700 μ F					
Capacitance tolerance 电容量公差	$\pm 20\%$ M					
Useful life 使用寿命 (105 °C, V_R , $I_{AC,R}$)	> 3000 h Requirements: $\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit		要求: $\Delta C/C \leq$ 初始值的 $\pm 20\%$ $\tan \delta \leq 2$ 倍最初限值的 $I_{leak} \leq$ 最初限值			
Leakage current I_{leak} (20 °C, after 5 minutes) 漏电流 I_{leak} (20 °C, 5分钟后)	$I_{leak} \leq 0.3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.7} + 4 \mu A$					
Dissipation factor (max.) 损耗角正切(最大值) (20 °C, 120 Hz)	V_R (V DC)	≤ 250	≥ 400			
	$\tan d$	0.15	0.20			
Low temperature stability 低温稳定性 (max impedance ratio) (最大阻抗比率) (120 Hz)	V_R (V DC)	≤ 250	≥ 400			
	$Z(-25$ °C)	4	7			
	$Z(+20$ °C)					
	$Z(-40$ °C)	7	13			
	$Z(+20$ °C)					
Shelf life 储存寿命	After storage for 1000 h at 105 °C, the capacitors shall meet the requirement of useful life test after reforming process. After test: V_R to be applied for 30 minutes. 24 to 48 hours before measurement. 105 °C 高温贮存 1000 小时, 并预处理后, 电容器必须符合负载寿命测试中对其电性能的要求。预处理方法: 先加载额定电压充电 30 分钟, 恢复 24 至 48 小时后再测试。					
Frequency multiplier for rated ripple current 200 V / 250 V 额定纹波电流的频率系数	$\varnothing$ (mm)	50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	22/25	0.72	1.00	1.40	1.50	1.51
	30	0.81	1.00	1.20	1.26	1.27
	35	0.84	1.00	1.14	1.19	1.20
Frequency multiplier for rated ripple current 400 V 额定纹波电流的频率系数	$\varnothing$ (mm)	50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	22/25	0.76	1.00	1.32	1.39	1.40
	30	0.78	1.00	1.26	1.32	1.33
	35	0.81	1.00	1.20	1.26	1.27
Frequency multiplier for rated ripple current 450 V 额定纹波电流的频率系数	$\varnothing$ (mm)	50 Hz	120 Hz	1 kHz	10 kHz	20 kHz
	22/25	0.76	1.00	1.32	1.39	1.40
	30	0.76	1.00	1.32	1.39	1.40
	35	0.78	1.00	1.26	1.32	1.33
Temperature multiplier for rated ripple current 额定纹波电流的温度系数	$+40$ °C		$+55$ °C	$+70$ °C	$+85$ °C	$+105$ °C
	3.05		2.8	2.4	2.0	1.0
Sectional specification 分规范	IEC 60384-4					

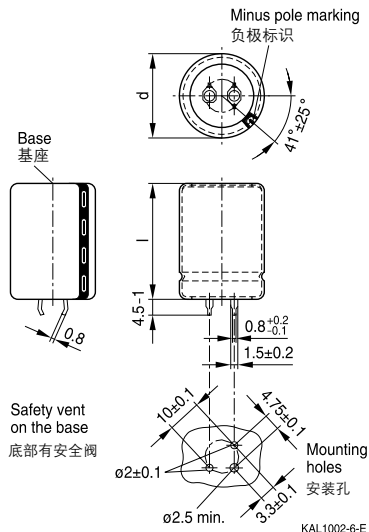
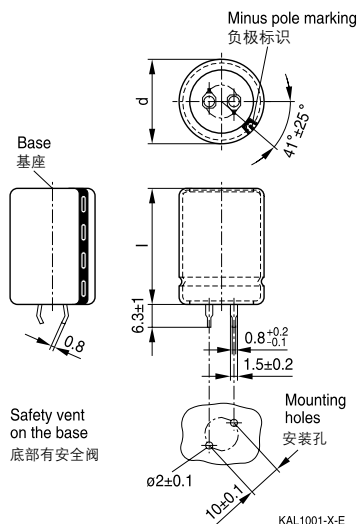


Dimensional drawings

尺寸图

Snap-in capacitors with standard insulation (PVC or PET)

标准绝缘功能的焊片电容器 (PVC 或 PET)



Snap-in terminals, length 6.3 ± 1 mm. Also available in a shorter version with a length of $4.5 - 1$ mm. PET insulation is marked with label "PET" on the sleeve.

焊片式端子，长 6.3 ± 1 mm。也可供长度为 $4.5 - 1$ mm 的较短型号产品。凡 PET 绝缘，套管上标注 PET 字样。

Snap-in capacitors are also available with 3 terminals (length $4.5 - 1$ mm). PET insulation is marked with label "PET" on the sleeve.

也可提供三端子焊片式电容器 (长度 $4.5 - 1$ mm) 凡 PET 绝缘，套管上标注 PET 字样。



B43508

Ultra compact – 105 °C 体积小型 – 105 °C

Ordering codes for terminal styles and insulation features

针脚类型与绝缘特点的订购码

Identification in 3rd block of ordering code

识别订货编码的第3方块

Snap-in capacitors

焊片式电容器

Terminal version 端子版本		Insulation version 绝缘版本	
		PVC	PET
Standard terminals 标准端子	6.3 mm	M000	M060
Short terminals 短端子	4.5 mm	M007	M067
3 terminals 3 端	4.5 mm	M002	M062

Ordering examples:

订购实例:

B43508A9107M007 } snap-in capacitor with short terminals and standard PVC insulation
短针脚焊片电容器, 标准PVC绝缘

B43508A9107M062 } snap-in capacitor with 3 terminals and PET insulation
3针脚焊片电容器, PET绝缘



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C	Case dimensions 外壳尺寸 d × l mm	ESR_{typ} 120 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{AC,max}$ 120 Hz 60 °C	$I_{AC,max}$ 120 Hz 85 °C	$I_{AC,R}$ 120 Hz 105 °C	Ordering code 订货编码
V DC	μF		mΩ	mΩ	A	A	A	
200	330	22 x 25	340	480	2.94	2.19	1.08	B43508A2337M0*#
	390	22 x 30	290	400	3.33	2.49	1.23	B43508A2397M0*#
	390	25 x 25	290	400	3.29	2.46	1.22	B43508B2397M0*#
	470	22 x 35	240	340	3.79	2.83	1.40	B43508A2477M0*#
	470	25 x 30	240	340	3.76	2.81	1.39	B43508B2477M0*#
	560	22 x 35	200	280	4.14	3.09	1.52	B43508A2567M0*#
	560	25 x 30	200	280	4.11	3.07	1.51	B43508B2567M0*#
	680	22 x 40	160	230	4.70	3.51	1.74	B43508A2687M0*#
	680	25 x 35	160	230	4.69	3.50	1.73	B43508B2687M0*#
	680	30 x 25	160	230	4.14	3.09	1.52	B43508C2687M0*#
	820	22 x 50	140	200	5.44	4.07	2.01	B43508A2827M0*#
	820	25 x 40	140	200	5.31	3.98	1.97	B43508B2827M0*#
	820	30 x 30	140	200	4.74	3.54	1.75	B43508C2827M0*#
	820	35 x 25	140	200	4.03	3.01	1.48	B43508D2827M0*#
	1000	25 x 45	110	160	6.03	4.51	2.22	B43508A2108M0*#
	1000	30 x 35	110	160	5.42	4.05	2.01	B43508B2108M0*#
	1000	35 x 30	110	160	4.93	3.69	1.82	B43508C2108M0*#
	1200	25 x 50	95	130	6.77	5.07	2.50	B43508A2128M0*#
	1200	30 x 40	95	130	6.52	4.88	2.41	B43508B2128M0*#
	1200	35 x 30	95	130	5.40	4.04	2.00	B43508C2128M0*#
	1500	30 x 45	75	110	7.50	5.60	2.77	B43508A2158M0*#
	1500	35 x 35	75	110	6.25	4.68	2.32	B43508B2158M0*#
	1800	30 x 50	60	90	8.43	6.30	3.11	B43508A2188M0*#
	1800	35 x 40	60	90	7.07	5.28	2.62	B43508B2188M0*#
	2200	35 x 45	50	75	8.03	6.02	2.98	B43508A2228M0*#
	2700	35 x 55	40	60	9.34	6.98	3.46	B43508A2278M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
0 = PVC insulation
6 = PET insulation
* = 绝缘特征
0 = PVC绝缘
6 = PET绝缘

= Terminal style
0 = snap-in standard terminals (6.3 mm)
2 = snap-in 3 terminals (4.5 mm)
7 = snap-in short terminals (4.5 mm)

= 端子类型
0 = 焊片式标准端子(6.3 mm)
2 = 焊片式3端子(4.5 mm)
7 = 焊片式短端子(4.5 mm)



B43508

Ultra compact – 105 °C 体积小型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C	Case dimensions 外壳尺寸 d × l mm	ESR_{typ} 120 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{AC,max}$ 120 Hz 60 °C	$I_{AC,max}$ 120 Hz 85 °C	$I_{AC,R}$ 120 Hz 105 °C	Ordering code 订货编码
V DC	μF		mΩ	mΩ	A	A	A	
250	220	22 × 25	510	710	2.55	1.91	0.94	B43508E2227M0*#
	270	22 × 30	410	580	2.95	2.20	1.09	B43508E2277M0*#
	330	22 × 30	340	480	3.25	2.44	1.21	B43508E2337M0*#
	330	25 × 25	340	480	3.20	2.39	1.18	B43508F2337M0*#
	390	22 × 35	290	400	3.67	2.74	1.36	B43508E2397M0*#
	390	25 × 30	290	400	3.63	2.71	1.34	B43508F2397M0*#
	470	22 × 40	240	340	4.15	3.11	1.53	B43508E2477M0*#
	470	25 × 30	240	340	3.98	2.98	1.47	B43508F2477M0*#
	470	30 × 25	240	340	3.58	2.68	1.33	B43508G2477M0*#
	560	22 × 45	200	280	4.66	3.48	1.72	B43508E2567M0*#
	560	25 × 35	200	280	4.50	3.37	1.67	B43508F2567M0*#
	560	30 × 30	200	280	4.08	3.05	1.50	B43508G2567M0*#
	680	22 × 50	160	230	5.26	3.93	1.95	B43508E2687M0*#
	680	25 × 40	160	230	5.12	3.83	1.90	B43508F2687M0*#
	680	30 × 30	160	230	4.50	3.37	1.66	B43508G2687M0*#
	680	35 × 25	160	230	3.77	2.82	1.39	B43508H2687M0*#
	820	25 × 45	140	200	5.78	4.33	2.13	B43508E2827M0*#
	820	30 × 35	140	200	5.12	3.83	1.90	B43508F2827M0*#
	820	35 × 30	140	200	4.59	3.43	1.70	B43508G2827M0*#
	1000	25 × 55	110	160	6.68	5.01	2.47	B43508E2108M0*#
	1000	30 × 40	110	160	6.21	4.65	2.30	B43508F2108M0*#
	1000	35 × 30	110	160	5.07	3.79	1.87	B43508G2108M0*#
	1200	30 × 45	95	130	6.99	5.23	2.59	B43508E2128M0*#
	1200	35 × 35	95	130	5.76	4.31	2.13	B43508F2128M0*#
	1500	30 × 55	75	110	8.20	6.14	3.04	B43508E2158M0*#
	1500	35 × 40	75	110	6.63	4.96	2.45	B43508F2158M0*#
	1800	35 × 50	60	90	7.66	5.74	2.83	B43508E2188M0*#
	2200	35 × 55	50	75	8.67	6.49	3.21	B43508E2228M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature

0 = PVC insulation

6 = PET insulation

* = 绝缘特征

0 = PVC绝缘

6 = PET绝缘

= Terminal style

0 = snap-in standard terminals (6.3 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)

= 端子类型

0 = 焊片式标准端子(6.3 mm)

2 = 焊片式3端子(4.5 mm)

7 = 焊片式短端子(4.5 mm)



Technical data and ordering codes

技术参数与订货编码

V_R	C_R 120 Hz 20 °C	Case dimensions 外壳尺寸 d × l mm	ESR_{typ} 120 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{AC,max}$ 120 Hz 60 °C	$I_{AC,max}$ 120 Hz 85 °C	$I_{AC,R}$ 120 Hz 105 °C	Ordering code 订货编码
V DC	μF		mΩ	mΩ	A	A	A	
400	100	22 x 25	1180	1730	1.68	1.26	0.62	B43508A9107M0*#
	120	22 x 30	990	1440	1.93	1.43	0.71	B43508A9127M0*#
	150	22 x 30	790	1150	2.15	1.61	0.79	B43508A9157M0*#
	150	25 x 25	790	1150	2.15	1.61	0.79	B43508B9157M0*#
	180	22 x 35	660	960	2.44	1.82	0.90	B43508A9187M0*#
	180	25 x 30	660	960	2.46	1.84	0.91	B43508B9187M0*#
	220	22 x 40	540	790	2.78	2.08	1.03	B43508A9227M0*#
	220	25 x 35	540	790	2.82	2.11	1.04	B43508B9227M0*#
	220	30 x 25	540	790	2.73	2.04	1.01	B43508C9227M0*#
	270	22 x 50	440	640	3.24	2.42	1.19	B43508A9277M0*#
	270	25 x 40	440	640	3.22	2.41	1.19	B43508B9277M0*#
	270	30 x 30	440	640	3.15	2.36	1.16	B43508C9277M0*#
	330	25 x 45	360	530	3.67	2.74	1.35	B43508A9337M0*#
	330	30 x 35	360	530	3.61	2.70	1.33	B43508B9337M0*#
	330	35 x 25	360	530	3.30	2.46	1.22	B43508C9337M0*#
	390	25 x 50	300	450	4.08	3.05	1.50	B43508A9397M0*#
	390	30 x 35	300	450	3.92	2.94	1.45	B43508B9397M0*#
	390	35 x 30	300	450	3.98	2.97	1.47	B43508C9397M0*#
	470	30 x 40	250	370	4.73	3.54	1.75	B43508A9477M0*#
	470	35 x 35	250	370	4.52	3.38	1.67	B43508B9477M0*#
	560	30 x 50	210	310	5.45	4.07	2.02	B43508A9567M0*#
	560	35 x 40	210	310	5.09	3.81	1.88	B43508B9567M0*#
	680	30 x 55	170	260	6.14	4.59	2.27	B43508A9687M0*#
	680	35 x 45	170	260	5.77	4.32	2.13	B43508B9687M0*#
	820	35 x 50	140	210	6.50	4.86	2.40	B43508A9827M0*#
	1000	35 x 55	120	180	7.34	5.49	2.72	B43508A9108M0*#

Composition of ordering code

订货编码的组成

* = Insulation feature
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7 = 焊片式短端子(4.5 mm)



B43508

Ultra compact – 105 °C 体积小型 – 105 °C

Technical data and ordering codes

技术参数与订货编码

V _R	C _R 120 Hz 20 °C	Case dimensions 外壳尺寸 d × l	ESR _{typ} 120 Hz 20 °C	Z _{max} 10 kHz 20 °C	I _{AC,max} 120 Hz 60 °C	I _{AC,max} 120 Hz 85 °C	I _{AC,R} 120 Hz 105 °C	Ordering code 订货编码
V DC	μF	mm	mΩ	mΩ	A	A	A	
450	82	22 x 25	1440	2100	1.63	1.22	0.60	B43508A5826M0*#
	100	22 x 30	1180	1730	1.87	1.40	0.69	B43508A5107M0*#
	100	25 x 25	1180	1730	1.87	1.40	0.69	B43508B5107M0*#
	120	22 x 35	990	1440	2.13	1.59	0.78	B43508A5127M0*#
	120	25 x 30	990	1440	2.14	1.60	0.79	B43508B5127M0*#
	150	22 x 40	790	1150	2.45	1.83	0.91	B43508A5157M0*#
	150	25 x 30	790	1150	2.40	1.79	0.89	B43508B5157M0*#
	150	30 x 25	790	1150	2.46	1.84	0.91	B43508C5157M0*#
	180	22 x 45	660	960	2.76	2.07	1.02	B43508A5187M0*#
	180	25 x 35	660	960	2.72	2.03	1.00	B43508B5187M0*#
	180	30 x 30	660	960	2.81	2.10	1.04	B43508C5187M0*#
	220	22 x 50	540	790	3.13	2.34	1.15	B43508A5227M0*#
	220	25 x 40	540	790	3.10	2.32	1.14	B43508B5227M0*#
	220	30 x 30	540	790	3.11	2.33	1.14	B43508C5227M0*#
	220	35 x 25	540	790	2.98	2.22	1.10	B43508D5227M0*#
	270	25 x 50	440	640	3.62	2.71	1.34	B43508A5277M0*#
	270	30 x 35	440	640	3.57	2.67	1.32	B43508B5277M0*#
	270	35 x 30	440	640	3.66	2.73	1.35	B43508C5277M0*#
	330	25 x 55	360	530	4.09	3.06	1.51	B43508A5337M0*#
	330	30 x 40	360	530	4.34	3.24	1.61	B43508B5337M0*#
	330	35 x 35	360	530	4.18	3.13	1.55	B43508C5337M0*#
	390	30 x 45	300	450	4.85	3.63	1.79	B43508A5397M0*#
	390	35 x 35	300	450	4.55	3.40	1.68	B43508B5397M0*#
	470	30 x 55	250	370	5.58	4.17	2.06	B43508A5477M0*#
	470	35 x 40	250	370	5.15	3.85	1.91	B43508B5477M0*#
	560	35 x 45	210	310	5.79	4.33	2.14	B43508A5567M0*#
	680	35 x 55	170	260	6.70	5.01	2.47	B43508A5687M0*#

Composition of ordering code

订货编码的组成

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7 = 焊片式短端子(4.5 mm)

Snap-in products packing unit information 焊片式产品包装信息

Capacitor dimension		Package unit information	
D(mm)	L(mm)	Size (mm)	Qty (pcs)
20	25	370 x 232 x 59	190
20	50	370 x 232 x 69	190
22	20	370 x 232 x 59	160
22	22	370 x 232 x 59	160
22	25	370 x 232 x 59	160
22	30	370 x 232 x 59	160
22	35	370 x 232 x 59	160
22	40	370 x 232 x 59	160
22	45	370 x 232 x 69	160
22	50	370 x 232 x 69	160
25.4	20	370 x 232 x 59	130
25.4	25	370 x 232 x 59	130
25.4	30	370 x 232 x 59	130
25.4	35	370 x 232 x 59	130
25.4	40	370 x 232 x 59	130
25.4	45	370 x 232 x 69	130
25.4	50	370 x 232 x 69	130
30	20	370 x 232 x 59	80
30	25	370 x 232 x 59	80
30	30	370 x 232 x 59	80
30	35	370 x 232 x 59	80
30	40	370 x 232 x 59	80
30	45	370 x 232 x 69	80
30	50	370 x 232 x 69	80
30	55	370 x 232 x 79	80
30	60	411 x 298 x 84	50
35	20	370 x 232 x 59	60
35	25	370 x 232 x 59	60
35	30	370 x 232 x 59	60
35	32	370 x 232 x 59	60
35	35	370 x 232 x 59	60
35	40	370 x 232 x 59	60
35	45	370 x 232 x 69	60
35	50	370 x 232 x 69	60
35	55	370 x 232 x 79	60
35	60	411 x 298 x 84	36
35	72	411 x 298 x 89	36
40	40	411 x 298 x 69	33
40	50	411 x 298 x 84	33
40	60	411 x 298 x 84	33
40	70	411 x 298 x 89	33
40	80	411 x 298 x 104	33
40	90	411 x 298 x 114	33
40	100	411 x 298 x 124	33
45	50	411 x 298 x 84	28
45	65	411 x 298 x 89	28
45	70	411 x 298 x 89	28
45	80	411 x 298 x 104	28
45	100	411 x 298 x 124	28

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