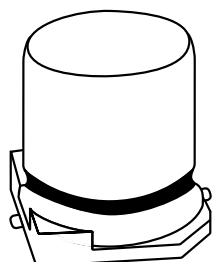


Aluminum Capacitors



FEATURES

- Polarized aluminum electrolytic capacitors, non solid electrolyte
- Extra low impedance, high ripple current
- Temperature up to 105 °C
- RoHS compliant


RoHS
COMPLIANT

APPLICATIONS

- SMD technology, for high mounting density
- Industrial and professional applications
- General industrial, consumer
- Smoothing, filtering, buffering

PACKAGING

- Supplied in blister tape

QUICK REFERENCE DATA

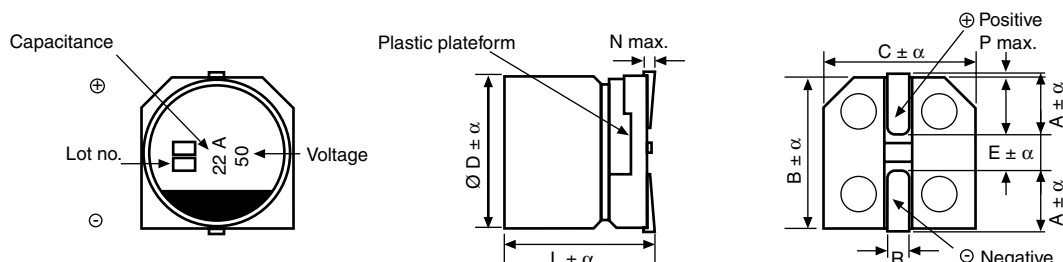
DESCRIPTION	UNIT	VALUE
Nominal case size (Ø D x L)	mm	6 x 5.8 to 12.5 x 13.5
Rated capacitance range C _R	µF	10 to 1500
Capacitance tolerance	%	± 20
Rated voltage range	V	6.3 to 100
Category temperature range	°C	- 40 to 105
Load life	h	2000
Based on sectional specification		IEC 60384-4/ EN 130300
Climatic category IEC 60068		40/105/56

SELECTION CHART FOR C_R, U_R AND RELEVANT NOMINAL CASE SIZES (Ø D x L in mm)

C _R (µF)	RATED VOLTAGE (V)					
	6.3	10	16	25	35	50
10	→	→	→	→	→	6.3 x 5.8
22	→	→	→	→	→	6.3 x 5.8
33	→	→	→	→	6.3 x 5.8	8 x 6.2
47	→	→	→	→	6.3 x 5.8	8 x 6.2
68	→	→	→	6.3 x 5.8	8 x 6.2	8 x 10
100	→	→	6.3 x 5.8	8 x 6.2	8 x 10	10 x 10
220	6.3 x 5.8	6.3 x 7.7	8 x 6.2	8 x 10	10 x 10	-
330	8 x 6.2	→	8 x 10	-	-	-
470	→	8 x 10	10 x 10	-	-	-
680	→	10 x 10	-	-	-	-
1000	10 x 10	-	-	-	-	-
1500	10 x 10	-	-	-	-	-

DIMENSIONS in millimeters

CASE SIZE CODE	$D \pm \alpha$	$L \pm \alpha$	$A \pm \alpha$	$B \pm \alpha$	$C \pm \alpha$	$E \pm \alpha$	R	N	P
AD	6.3 ± 0.5	5.8 ± 0.3	2.4 ± 0.2	6.6 ± 0.2	6.6 ± 0.2	2.2 ± 0.2	0.5 ~ 0.8	0.3	0.5
BM	6.3 ± 0.5	7.7 ± 0.4	2.4 ± 0.2	6.6 ± 0.2	6.6 ± 0.2	2.2 ± 0.2	0.5 ~ 0.8	0.3	0.5
AE	8 ± 0.5	6.2 ± 0.4	3.3 ± 0.2	8.3 ± 0.2	8.3 ± 0.2	2.3 ± 0.2	0.5 ~ 0.8	0.3	0.5
AF	8 ± 0.5	10 ± 0.5	2.9 ± 0.2	8.3 ± 0.2	8.3 ± 0.2	3.1 ± 0.2	0.8 ~ 1.1	0.3	0.5
AG	10 ± 0.5	10 ± 0.5	3.2 ± 0.2	10.3 ± 0.2	10.3 ± 0.2	4.5 ± 0.2	0.8 ~ 1.1	0.3	0.5
AH	12.5 ± 0.5	13.5 ± 0.5	4.6 ± 0.2	12.8 ± 0.2	12.8 ± 0.2	4.5 ± 0.2	1.1 ~ 1.4	0.3	0.5

**ELECTRICAL DATA**

SYMBOL	DESCRIPTION
U_R	rated voltage
C_R	rated capacitance at 120 Hz
$\tan \delta$	max. dissipation factor at 120 Hz
R_{ESR}	max. equivalent series resistance at 120 Hz
I_R	rated alternating current at 120 Hz and upper category temperature
Z	max. impedance at 100 kHz

Note

Unless otherwise specified, all electrical values apply at
 $T_{amb} = 20^\circ\text{C}$, $P = 86$ to 100 kPa, $RH = 45$ to 75% .

ORDERING EXAMPLE

ECL 22 μF /50 V, $\pm 20\%$, size 6.3 x 5.8 mm

Ordering code: MALSECL00AD222HARK

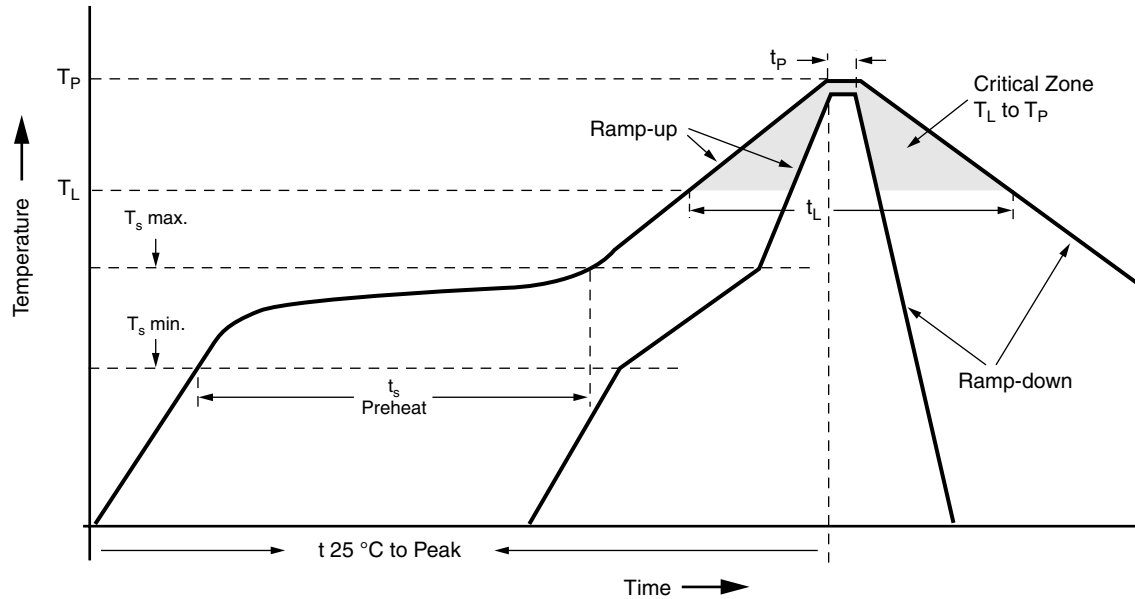
For Standard Packaging Quantity (SPQ) and Minimum Order Quantity (MOQ) please refer to our price list or contact customer service.

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (μF)	DIMENSIONS D x L (mm)	$\tan \delta$ 120 Hz	Z 100 kHz/ 20 °C (Ω)	I_R 100 kHz/ 105 °C (mA)	WEIGHT (g)	CATALOG NUMBER
6.3	220	6.3 x 5.8	0.24	0.44	230	0.30	MALSECL00AD322BARK
	330	8 x 6.2	0.24	0.26	300	0.55	MALSECL00AE333BARK
	1000	10 x 10	0.24	0.09	670	1.21	MALSECL00AG410BARK
	1500	10 x 10	0.24	0.09	670	1.21	MALSECL00AG415BARK
10	220	6.3 x 7.7	0.19	0.34	280	0.40	MALSECL00BM322CARK
	470	8 x 10	0.19	0.17	450	1.00	MALSECL00AF347CARK
	680	10 x 10	0.19	0.09	670	1.21	MALSECL00AG368CARK
16	100	6.3 x 5.8	0.16	0.44	230	0.30	MALSECL00AD310DARK
	220	8 x 6.2	0.16	0.26	300	0.55	MALSECL00AE322DARK
	330	8 x 10	0.16	0.17	450	1.00	MALSECL00AF333DARK
	470	10 x 10	0.16	0.09	670	1.21	MALSECL00AG347DARK
25	68	6.3 x 5.8	0.14	0.44	230	0.30	MALSECL00AD268EARK
	100	8 x 6.2	0.14	0.26	300	0.55	MALSECL00AE310EARK
	220	8 x 10	0.14	0.17	450	1.00	MALSECL00AF322EARK

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (μ F)	DIMENSIONS D x L (mm)	$\tan \delta$ 120 Hz	Z 100 kHz/ 20 °C (Ω)	I_R 100 kHz/ 105 °C (mA)	WEIGHT (g)	CATALOG NUMBER
35	33	6.3 x 5.8	0.12	0.44	230	0.30	MALSECL00AD233FARK
	47	6.3 x 5.8	0.12	0.44	230	0.30	MALSECL00AD247FARK
	68	8 x 6.2	0.12	0.26	300	0.55	MALSECL00AE268FARK
	100	8 x 10	0.12	0.17	450	1.00	MALSECL00AF310FARK
	220	10 x 10	0.12	0.09	670	1.21	MALSECL00AG322FARK
50	10	6.3 x 5.8	0.12	0.88	165	0.30	MALSECL00AD210HARK
	22	6.3 x 5.8	0.12	0.88	165	0.30	MALSECL00AD222HARK
	33	8 x 6.2	0.12	0.63	300	0.55	MALSECL00AE233HARK
	47	8 x 6.2	0.12	0.63	300	0.55	MALSECL00AE247HARK
	68	8 x 10	0.12	0.34	450	1.00	MALSECL00AF268HARK
	100	10 x 10	0.12	0.18	670	1.21	MALSECL00AG310HARK

REFLOW SOLDERING CONDITIONS FOR SMD ALUMINUM ELECTROLYTIC CAPACITORS

PROFILE FEATURE

	SOLDERING CONDITION		
	$\varnothing 4 \sim \varnothing 10$	$\varnothing 12.5$	$\varnothing 16$
Average ramp-up rate (T_L to T_P)	3 °C/s max.	3 °C/s max.	
Preheat			
Temperature min. ($T_s \text{ min.}$)	150 °C	150 °C	
Temperature max. ($T_s \text{ max.}$)	200 °C	200 °C	
Time ($T_s \text{ min.}$ to $T_s \text{ max.}$)	60 ~ 150 s	40 ~ 120 s	40 ~ 100 s
$T_s \text{ max.}$ to T_L			
Ramp-up rate	3 °C/s max.	3 °C/s max.	
Time maintained above			
Temperature (T_L)	217 °C	217 °C	
Time (t_L)	60 ~ 90 s	40 ~ 60 s	

PROFILE FEATURE

Peak/classification temperature (T_P)	250 °C	240 °C	230 °C
Time within 5 °C of actual peak temperature (T_P)	10 s max.	10 s max.	
Ramp-down rate	3 °C/s max.	3 °C/s max.	
Time 25 °C to peak temperature	8 min max.	8 min max.	

RESISTANCE TO SOLDERING HEAT

Leakage current	Less than specified value
Capacitance value	Within $\pm 10\%$ of initial value
$\tan \delta$	Less than specified value

LOW TEMPERATURE BEHAVIOR (at 120 Hz)

IMPEDANCE RATIO (Z) T2/(Z) T1	RATED VOLTAGE (V)							
T2/T1	6.3	10	16	25	35	50	63	100
- 25 °C/+ 20 °C	2	2	2	2	2	2	3	3
- 40 °C/+ 20 °C	3	3	3	3	3	3	4	4

MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY

FREQUENCY (Hz)	I_R MULTIPLIER
50	0.41
120	0.59
300	0.69
1000	0.80
10 000	0.88
100 000	1.00

ADDITIONAL ELECTRICAL DATA

PARAMETER	CONDITIONS	VALUE
Current		
Leakage current (Test conditions: U_R , 20 °C)	After 2 min at U_R	$I_{L2} \leq 0.01 \times C_R \times U_R$ or 3 μA for $U_R \leq 100 V$ (whichever is greater)
Resistance		
Equivalent series resistance (ESR)	Calculated from $\tan \delta_{max.}$	$ESR = \tan \delta / 2 \pi f C_R$

TEST PROCEDURES AND REQUIREMENTS

TEST	PROCEDURE (QUICK REFERENCE)	REQUIREMENTS
Load life	$T_{amb} = 105\text{ °C}$ U_R and I_R applied After 2000 h	$\Delta C/C: \pm 25\%$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$
Shelf life	No voltage applied After 1000 h After test: U_R to be applied for 30 min 24 to 48 h before measurement	$\Delta C/C: \pm 25\%$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331