Aluminum Capacitors
Power Printed Wiring Style



FEATURES

- Very long useful life: 12 000 h at + 85 °C
- High ripple current capability
- High resistance to shock and vibration
- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Large types with reduced dimensions, cylindrical aluminum case, insulated
- Provided with keyed polarity
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

APPLICATIONS

- General purpose, industrial and audio/video systems
- Smoothing and filtering
- Standard and switched mode power supplies
- Energy storage in pulse systems

MARKING

The capacitors are marked (where possible) with the following information:

- Rated capacitance (in µF)
- Tolerance on rated capacitance, code letter in accordance with IEC 60062 (M for ± 20 %)
- Rated voltage (in V)
- Date code (YYMM)
- Name of manufacturer
- Code for factory of origin
- Polarity of the terminals and "-" sign to indicate the negative terminal, visible from the top and/or side of the capacitor
- Code number
- Climatic category in accordance with IEC 60068

QUICK REFERENCE DATA	
DESCRIPTION	VALUE
	≤ 100 V
Nominal case size (Ø D x L in mm)	25 x 30 to 40 x 100
Rated capacitance range (E6 series), C_R	680 µF to 150 000 µF
Tolerance on C_R	± 20 %
Rated voltage range, U_R	10 V to 100 V
Category temperature range	- 40 °C to + 85 °C
Endurance test at 85 °C	5000 h
Useful life at 85 °C	12 000 h
Useful life at 40 °C, 1.4 x I_R applied	190 000 h
Shelf life at 0 V, 85 °C	500 h
Based on sectional specification	IEC 60384-4/EN 130300
Climatic category IEC 60068	40/085/56

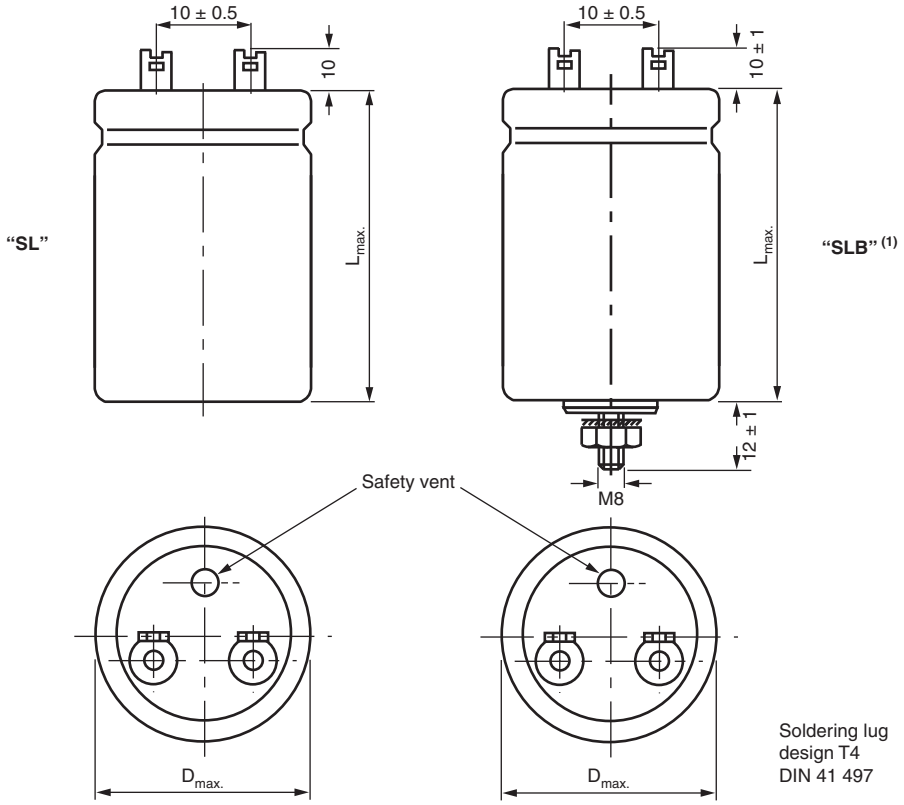
SELECTION CHART FOR C_R, U_R, AND RELEVANT NOMINAL CASE SIZES (Ø D x L in mm)

C_R (µF)	U_R (V)					
	10	16	25	40	63	100
680	-	-	-	-	-	25 x 30
1000	-	-	-	-	-	25 x 40
1500	-	-	-	-	-	30 x 40
2200	-	-	-	-	25 x 30	35 x 40
3300	-	-	-	25 x 30	25 x 40	35 x 50
4700	-	-	25 x 30	25 x 40	30 x 40	40 x 50
6800	-	25 x 30	25 x 40	30 x 40	35 x 40	40 x 70
10 000	25 x 30	25 x 40	30 x 40	35 x 40	35 x 50	40 x 100
15 000	25 x 40	30 x 40	35 x 40	35 x 50	40 x 70	-
22 000	30 x 40	35 x 40	35 x 50	40 x 50	40 x 100	-
33 000	35 x 40	35 x 50	40 x 50	40 x 70	-	-
47 000	35 x 50	40 x 50	40 x 70	40 x 100	-	-
68 000	40 x 50	40 x 70	40 x 100	-	-	-
100 000	40 x 70	40 x 100	-	-	-	-
150 000	40 x 100	-	-	-	-	-

For technical questions, contact: aluminumcaps2@vishay.com

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DIMENSIONS in millimeters AND AVAILABLE FORMS



Note

(1) The MOQ for SLB-version is 5000 pieces.

MOUNTING

When a number of capacitors are connected in a bank, they must not be closer together than 15 mm, when no derating of ripple current and/or temperature is applied.

DIMENSIONS in millimeters, MASS, AND PACKAGING QUANTITIES					
NOMINAL CASE SIZE Ø D x L	Ø $D_{max.}$	$l_{max.}$	MASS (g)	PACKAGING QUANTITIES (units per box)	CARDBOARD BOX DIMENSIONS L x W x H
25 x 30	26	32	≈ 24	100	290 x 280 x 50
25 x 40	26	42	≈ 28	100	290 x 280 x 60
30 x 40	31	42	≈ 38	100	340 x 330 x 60
35 x 40	36	42	≈ 51	50	390 x 198 x 60
35 x 50	36	52	≈ 66	50	390 x 198 x 70
40 x 50	41	52	≈ 82	50	440 x 223 x 70
40 x 70	41	72	≈ 110	25	230 x 230 x 90
40 x 100	41	102	≈ 176	25	230 x 230 x 120

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ELECTRICAL DATA	
SYMBOL	DESCRIPTION
C_R	Rated capacitance at 100 Hz
I_R	Rated RMS ripple current at 100 Hz, 85 °C or at 20 kHz, 70 °C
I_{L1}	Max. leakage current after 1 min at U_R
I_{L5}	Max. leakage current after 5 min at U_R
ESR	Max. equivalent series resistance at 100 Hz
Z	Max. impedance at 10 kHz

Note

- Unless otherwise specified, all electrical values apply at T_{amb} = 20 °C, P = 86 kPa to 106 kPa, RH = 45 % to 75 %.

ORDERING EXAMPLE

EYK 01: 10 000 µF/25 V

Version 01 (no stud mounting)
Size: 30 mm x 40 mm
Ordering number: MALLEYK01BB510E02W

EYK 02: 10 000 µF/25 V

Version 02 (stud mounting) (1)
Size: 30 mm x 40 mm
Ordering number: MALLEYK02BB510E01W

Note

(1) MOQ for version 02: 5000 pieces.

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_R 20 kHz 70 °C (A)	I_{L1} 1 min (mA)	I_{L5} 5 min (mA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	ORDERING CODE
10	10 000	25 x 30	3.1	5.9	0.60	0.20	51	40	MALLEYK01AV510C02W
	15 000	25 x 40	4.1	7.8	0.90	0.30	37	30	MALLEYK01AB515C02W
	22 000	30 x 40	5.0	9.5	1.32	0.44	30	25	MALLEYK01BB522C02W
	33 000	35 x 40	5.5	10.4	1.98	0.66	28	24	MALLEYK01CB533C02W
	47 000	35 x 50	6.8	12.9	2.82	0.94	23	20	MALLEYK01CD547C02W
	47 000	40 x 40	5.8	10.4	2.82	0.94	29	22	MALLEYK01DB547C02W
	68 000	40 x 50	7.1	13.5	4.08	1.36	24	20	MALLEYK01DD568C02W
	100 000	40 x 70	9.2	17.4	6.00	2.00	19	16	MALLEYK01DG610C02W
	150 000	40 x 100	12.0	22.7	9.00	3.00	16	14	MALLEYK01DM615C02W
16	6800	25 x 30	3.1	5.9	0.65	0.22	53	42	MALLEYK01AV468D02W
	10 000	25 x 40	4.0	7.6	0.96	0.32	39	34	MALLEYK01AB510D02W
	15 000	30 x 40	5.0	9.5	1.44	0.48	31	27	MALLEYK01BB515D02W
	22 000	35 x 40	5.5	10.4	2.12	0.71	29	26	MALLEYK01CB522D02W
	33 000	35 x 50	6.7	12.7	3.17	1.06	23	21	MALLEYK01CD533D02W
	33 000	40 x 40	5.7	10.8	3.17	1.06	30	24	MALLEYK01DB533D02W
	47 000	40 x 50	7.0	13.3	4.52	1.51	24	20	MALLEYK01DD547D02W
	68 000	40 x 70	9.2	17.4	6.53	2.18	19	16	MALLEYK01DG568D02W
	100 000	40 x 100	12.0	22.7	9.60	3.20	16	14	MALLEYK01DM610D02W
25	4700	25 x 30	2.9	5.5	0.71	0.24	60	42	MALLEYK01AV447E02W
	6800	25 x 40	3.9	7.4	1.02	0.34	42	34	MALLEYK01AB468E02W
	10 000	30 x 40	4.8	9.1	1.50	0.50	34	27	MALLEYK01BB510E02W
	15 000	35 x 40	5.3	10.0	2.25	0.75	30	26	MALLEYK01CB515E02W
	22 000	35 x 50	6.5	12.3	3.30	1.10	24	321	MALLEYK01CD522E02W
	22 000	40 x 40	5.7	10.8	3.30	1.10	31	24	MALLEYK01DB522E02W
	33 000	40 x 50	7.0	13.3	4.95	1.65	25	20	MALLEYK01DD533E02W
	47 000	40 x 70	9.2	17.4	7.05	2.35	19	16	MALLEYK01DG547E02W
	68 000	40 x 100	12.0	22.7	10.20	3.40	16	14	MALLEYK01DM568E02W
40	3300	25 x 30	2.9	5.5	0.80	0.27	87	63	MALLEYK01AV433G02W
	4700	25 x 40	3.8	7.2	1.13	0.38	62	47	MALLEYK01AB447G02W
	6800	30 x 40	4.7	8.9	1.64	0.55	49	38	MALLEYK01BB468G02W
	10 000	35 x 40	5.2	9.8	2.40	0.80	48	37	MALLEYK01CB510G02W
	15 000	35 x 50	6.3	11.9	3.60	1.20	37	28	MALLEYK01CD515G02W
	15 000	40 x 40	5.6	10.6	3.60	1.20	50	35	MALLEYK01DB515G02W
	22 000	40 x 50	5.8	11.0	5.28	1.76	39	28	MALLEYK01DD522G02W
	33 000	40 x 70	7.8	14.8	7.92	2.64	28	21	MALLEYK01DG533G02W
	47 000	40 x 100	10.4	19.7	11.28	3.76	22	17	MALLEYK01DM547G02W
63	2200	25 x 30	2.5	4.7	0.84	0.28	83	62	MALLEYK01AV422J02W
	3300	25 x 40	3.3	6.2	1.25	0.42	58	42	MALLEYK01AB433J02W
	4700	30 x 40	4.1	7.8	1.78	0.60	49	38	MALLEYK01BB447J02W
	6800	35 x 40	4.5	8.5	2.57	0.86	48	37	MALLEYK01CB468J02W
	10 000	35 x 50	5.4	10.2	3.78	1.26	37	28	MALLEYK01CD510J02W
	10 000	40 x 40	4.6	8.7	3.78	1.26	52	37	MALLEYK01DB510J02W
	15 000	40 x 70	7.5	14.2	5.67	1.89	29	24	MALLEYK01DG515J02W
	22 000	40 x 100	10.0	19.0	8.32	2.77	22	19	MALLEYK01DM522J02W

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ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_R 20 kHz 70 °C (A)	I_{L1} 1 min (mA)	I_{L5} 5 min (mA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	ORDERING CODE
100	680	25 x 30	1.74	3.30	0.41	0.14	190	130	MALLEYK01AV368L02W
	1000	25 x 40	2.34	4.44	0.60	0.20	130	90	MALLEYK01AB410L02W
	1500	30 x 40	2.95	5.59	0.90	0.30	95	67	MALLEYK01BB415L02W
	2200	35 x 40	3.69	7.00	1.32	0.44	71	53	MALLEYK01CB422L02W
	3300	35 x 50	4.37	8.29	1.98	0.66	55	41	MALLEYK01CD433L02W
	3300	40 x 40	4.16	7.89	1.98	0.66	64	48	MALLEYK01DB433L02W
	4700	40 x 50	5.21	9.88	2.82	0.94	49	38	MALLEYK01DD447L02W
	6800	40 x 70	6.97	13.22	4.08	1.36	35	28	MALLEYK01DG468L02W
	10 000	40 x 100	9.50	18.00	6.00	2.00	26	21	MALLEYK01DM510L02W

ADDITIONAL ELECTRICAL DATA

PARAMETER	CONDITIONS	VALUE
Voltage		
Surge voltage	≤ 250 V versions	$U_s = 1.15 \times U_R$
Reverse voltage		$U_{rev} \leq 1$ V
Current		
Leakage current	After 1 min at U_R	$I_{L1} \leq 0.006\ C_R \times U_R + 4$ µA
	After 5 min at U_R	$I_{L5} \leq 0.002\ C_R \times U_R + 4$ µA
Inductance		
Equivalent series inductance (ESL)	Case Ø D = 25 mm	Max. 25 nH
	Case Ø D = 30 mm and 35 mm	Max. 30 nH
	Case Ø D = 40 mm	Max. 35 nH

LIFETIME TABLE Rated voltage: ≤ 100 V

INTERRELATION BETWEEN ALTERNATING CURRENT, AMBIENT TEMPERATURE, AND LIFETIME

I/I_R (frequency dependent)						SURFACE TEMPERATURE RISE	LIFETIME MULTIPLIER (depending on I/I_R and T_{amb})									
FREQUENCY (Hz)							AMBIENT TEMPERATURE T_{amb} (°C)									
50	100	250	500	1000	> 2500	ΔT_0 (°C)	40	45	50	55	60	65	70	75	80	85
0.19	0.20	0.21	0.22	0.23	0.24	0.2	63	40	26	17	11	7.4	5.0	3.4	2.4	1.64
0.39	0.40	0.42	0.44	0.46	0.47	0.6	57	36	23	15	10	6.8	4.6	3.2	2.2	1.53
0.58	0.60	0.62	0.66	0.69	0.71	1.3	48	31	20	13	8.9	6.0	4.1	2.8	2.0	1.38
0.78	0.80	0.83	0.88	0.92	0.95	2.1	39	25	17	11	7.5	5.1	3.5	2.4	1.7	1.21
0.97	1.00	1.04	1.10	1.15	1.18	3.2	30	20	13	9.0	6.1	4.2	2.9	2.0	1.4	1.00
1.17	1.20	1.25	1.31	1.38	1.42	4.4	22	15	10	7.0	4.8	3.4	2.3	1.7	1.2	
1.36	1.40	1.46	1.53	1.61	1.66	6.0	16	11	7.7	5.3	3.7	2.6	1.8	1.3		
1.55	1.60	1.67	1.75	1.84	1.89	7.9	11	8.0	5.6	3.9	2.8	2.0	1.4	1.0		
1.75	1.80	1.87	1.97	2.07	2.13	10	7.8	5.5	3.9	2.8	2.0	1.4	1.0			
1.94	2.00	2.08	2.19	2.30	2.37	12	5.3	3.8	2.7	2.0	1.4	1.0				
2.14	2.20	2.29	2.41	2.53	2.60	15	3.5	2.5	1.8	1.3						
2.33	2.40	2.50	2.63	2.76	2.84	17	2.2	1.6	1.2							
2.53	2.60	2.71	2.85	2.99	3.08	20	1.4	1.1								

combination not permitted

Notes

I_R 100 Hz alternating current (A) at upper category temperature T_{UC} taken from datasheet
I User current (A)
T_{amb} Ambient temperature of capacitor (°C)
ΔT_0 Surface temperature rise of capacitor caused by AC load (°C)
L Lifetime multiplier

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