

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



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:

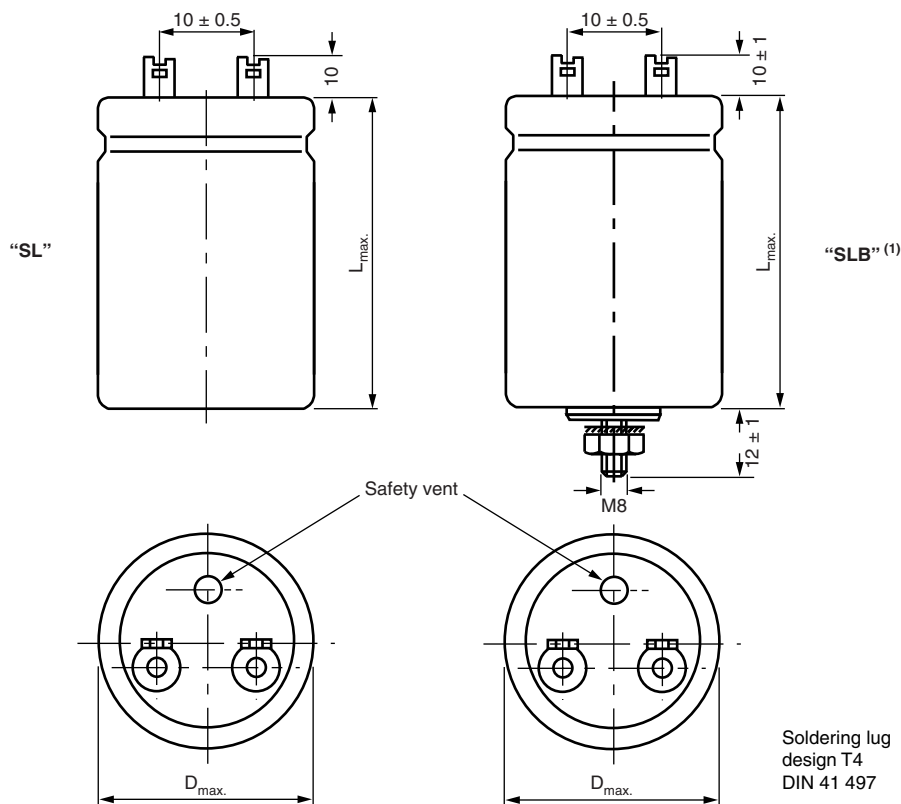
- Rated capacitance (in μF)
- Tolerance on rated capacitance, code letter in accordance with IEC 60062 (M for $\pm 20\%$)
- Rated voltage (in V)
- Date code (YYMM)
- Name of manufacturer
- Code for factory of origin
- Polarity of the terminals and “-” sign to indicate the negative terminal, visible from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

QUICK REFERENCE DATA	
DESCRIPTION	VALUE
	$\leq 100\text{ V}$
Nominal case size (\varnothing 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	$\pm 20\%$
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 (\varnothing 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	-	-	-	-	-



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



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 $T_{amb} = 20\text{ °C}$, $P = 86\text{ kPa}$ to 106 kPa , $RH = 45\%$ to 75% .

ORDERING EXAMPLE

EYK 01: 10 000 $\mu\text{F}/25\text{ V}$
 Version 01 (no stud mounting)
 Size: 30 mm x 40 mm
 Ordering number: MALLEYK01BB510E02W

EYK 02: 10 000 $\mu\text{F}/25\text{ V}$
 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 $\varnothing D \times L$ (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 (m Ω)	Z 10 kHz (m Ω)	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



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	$I_{L1} \leq 0.006 C_R \times U_R + 4 \mu A$
	After 5 min at U_R	$I_{L5} \leq 0.002 C_R \times U_R + 4 \mu A$
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 ΔT_0 (°C)	LIFETIME MULTIPLIER (depending on I/I_R and T_{amb})										
FREQUENCY (Hz)							AMBIENT TEMPERATURE T_{amb} (°C)										
50	100	250	500	1000	> 2500	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									

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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