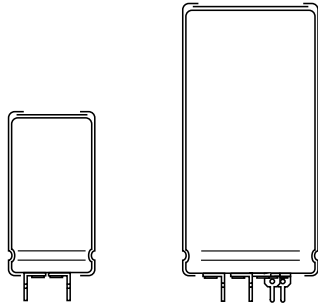


Aluminum Capacitors

Power 105 °C Printed Wiring Style



Component outlines.

FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Large types, minimized dimensions, cylindrical aluminum case, insulated with a blue sleeve
- Provided with keyed polarity
- Very long useful life: 5000 hours at 105 °C
- Low ESR, high ripple current capability
- Temperature range up to 105 °C
- High resistance to shock and vibration


 Available
RoHS*
 COMPLIANT

APPLICATIONS

- Computer, telecommunication and industrial 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

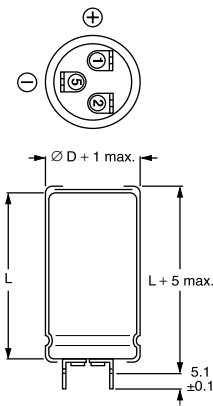
QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case size ($\varnothing D \times L$ in mm)	25 × 30 to 40 × 100
Rated capacitance range (E6 series), C_R	470 to 150000 μF 68 to 3300 μF
Tolerance on C_R	$\pm 20\%$
Rated voltage range, U_R	10 to 100 V 200 to 400 V
Category temperature range	- 40 to + 105 °C
Endurance test at 105 °C	2000 hours
Useful life at 105 °C	5000 hours
Useful life at 40 °C, $1.9 \times I_R$ applied	150000 hours
Shelf life at 0 V, 105 °C	500 hours
Based on sectional specification	IEC 60384-4/EN130300
Climatic category IEC 60068	40/105/56

SELECTION CHART FOR C_R , U_R AND RELEVANT NOMINAL CASE SIZES ($\varnothing D \times L$ in mm)						
C_R (μF)	U_R (V)					
	10	16	25	40	63	100
470	-	-	-	-	-	25 × 30
680	-	-	-	-	-	25 × 40
1000	-	-	-	-	25 × 30	30 × 40
1500	-	-	-	-	25 × 40	35 × 40
2200	-	-	-	25 × 30	30 × 40	35 × 50
	-	-	-	-	-	40 × 40
3300	-	-	-	25 × 40	35 × 40	40 × 50
4700	-	-	25 × 30	30 × 40	35 × 50	40 × 70
	-	-	-	-	40 × 40	-
6800	-	25 × 30	25 × 40	35 × 40	40 × 50	40 × 100
10000	25 × 30	25 × 40	30 × 40	35 × 50	40 × 70	-
	-	-	-	40 × 40	-	-
15000	25 × 40	30 × 40	35 × 40	40 × 50	40 × 100	-
22000	30 × 40	35 × 40	35 × 50	40 × 70	-	-
	-	-	40 × 40	-	-	-
33000	35 × 40	35 × 50	40 × 50	40 × 100	-	-
	-	40 × 40	-	-	-	-
47000	35 × 50	40 × 50	40 × 70	-	-	-
	40 × 40	-	-	-	-	-
68000	40 × 50	40 × 70	40 × 100	-	-	-
100000	40 × 70	40 × 100	-	-	-	-
150000	40 × 100	-	-	-	-	-

*Pb containing terminations are not RoHS compliant, exemptions may apply

SELECTION CHART FOR C_R, U_R AND RELEVANT NOMINAL CASE SIZES (∅ D × L in mm)				
C _R (μF)	U _R (V)			
	200	250	385	400
68	–	–	25 × 30	25 × 30
100	–	25 × 30	25 × 40	25 × 40
150	25 × 30	25 × 40	30 × 40	30 × 40
220	25 × 40	30 × 40	35 × 40	35 × 40
330	30 × 40	35 × 40	35 × 50	35 × 50
	–	–	40 × 40	40 × 40
470	35 × 40	35 × 50	40 × 50	40 × 50
	–	40 × 40	–	–
680	35 × 50	40 × 50	40 × 70	40 × 70
	40 × 50	–	–	–
1000	40 × 50	40 × 70	40 × 100	40 × 100
1500	40 × 70	40 × 100	–	–
2200	40 × 100	–	–	–

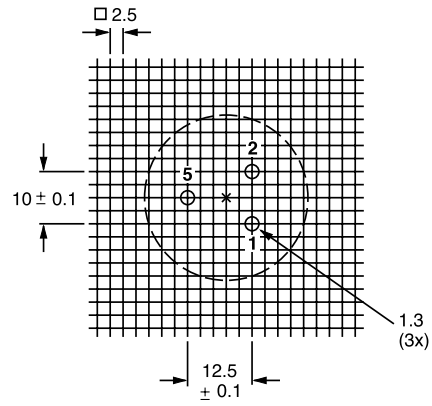
DIMENSIONS in millimeters **AND AVAILABLE FORMS**



1 = positive terminal; 5 = negative terminal.

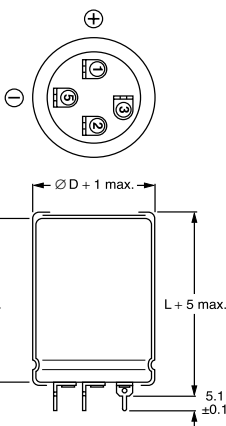
Case ∅ D = 25 mm.

Fig.1 Printed wiring pin version.



Case ∅ D = 25 mm.

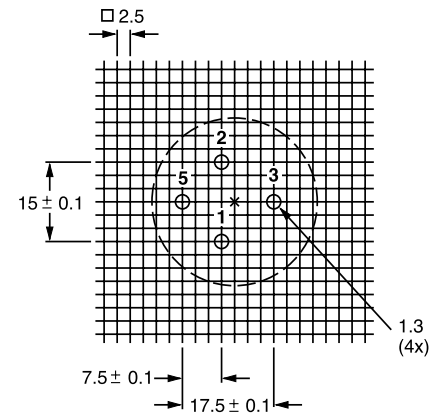
Fig.2 Mounting hole diagram viewed from component side.



1 = positive terminal; 5 = negative terminal.

Case ∅ D = 30 mm.

Fig.3 Printed wiring pin version.

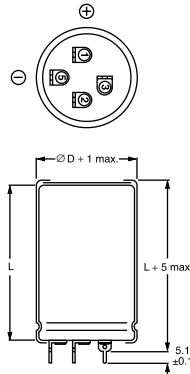


Case ∅ D = 30 mm.

Fig.4 Mounting hole diagram viewed from component side.

Aluminum Capacitors Power 105 °C Printed Wiring Style

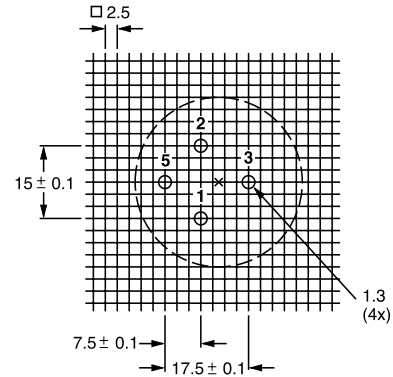
Vishay Roederstein



1 = positive terminal; 5 = negative terminal.

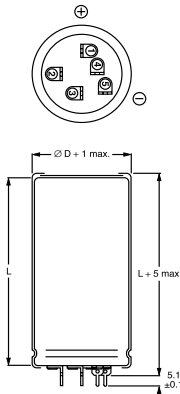
Case $\varnothing D = 35 \text{ mm.}$

Fig.5 Printed wiring pin version.



Case $\varnothing D = 35 \text{ mm.}$

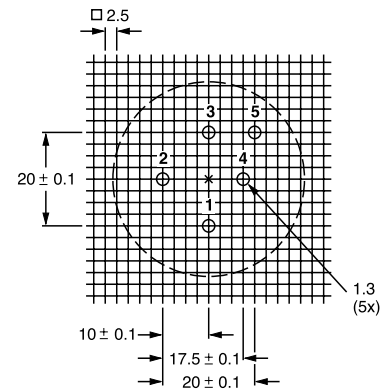
Fig.6 Mounting hole diagram viewed from component side.



1 = positive terminal; 5 = negative terminal.

Case $\varnothing D = 40 \text{ mm.}$

Fig.7 Printed wiring pin version.



Case $\varnothing D = 40 \text{ mm.}$

Fig.8 Mounting hole diagram viewed from component side.

DIMENSIONS in millimeters, MASS AND PACKAGING QUANTITIES PW versions						
NOMINAL CASE SIZE $\varnothing D \times L$	$\varnothing D_{\text{max}}$	L_{max}	MASS (g)	PACKAGING QUANTITIES (units per box)	CARDBOARD BOX DIMENSIONS $L \times W \times H$	
25 × 30	26	35	≈ 24	100	290 × 280 × 50	
25 × 40	26	45	≈ 28	100	290 × 280 × 60	
30 × 40	31	45	≈ 38	100	340 × 330 × 60	
35 × 40	36	45	≈ 51	50	390 × 198 × 60	
35 × 50	36	55	≈ 66	50	390 × 198 × 70	
40 × 40	41	45	≈ 78	50	440 × 223 × 60	
40 × 50	41	55	≈ 82	50	440 × 223 × 70	
40 × 70	41	75	≈ 110	25	230 × 230 × 90	
40 × 100	41	105	≈ 176	25	230 × 230 × 120	

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.

Pin numbers 2, 3 and 4 (if present) must be free from the electrical circuit.

ELECTRICAL DATA	
SYMBOL	DESCRIPTION
C_R	rated capacitance at 100 Hz
I_R	rated RMS ripple current at 100 Hz and 105 °C
I_{L1}	max. leakage current after 1 minute at U_R
I_{L5}	max. leakage current after 5 minutes at U_R
ESR	max. equivalent series resistance at 100 Hz
Z	max. impedance at 10 kHz

Note

1. Unless otherwise specified, all electrical values in Tables and 3 apply at $T_{amb} = 20\text{ °C}$, $P = 86\text{ to }106\text{ kPa}$, $RH = 45\text{ to }75\%$.

ORDERING EXAMPLE

10000 μF / 25 V; $\pm 20\%$

Nominal case size: $\varnothing 30 \times 40\text{ mm}$

Catalog number: EYZ00BB510E02V

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 105 °C (A)	I_{L1} 1 min (mA)	I_{L5} 5 min (mA)	ESR 100 Hz (m Ω)	Z 10 kHz (m Ω)	CATALOG NUMBER
10	10000	25 × 30	3.17	0.60	0.20	48	37	EYZ00AV510C02V
	15000	25 × 40	4.21	0.90	0.30	34	27	EYZ00AB515C02V
	22000	30 × 40	5.05	1.32	0.44	29	23	EYZ00BB522C02V
	33000	35 × 40	5.63	1.98	0.66	27	22	EYZ00CB533C02V
	47000	35 × 50	6.19	2.82	0.94	26	21	EYZ00CD547C02V
	47000	40 × 40	6.19	2.82	0.94	26	21	EYZ00DB547C02V
	68000	40 × 50	7.64	4.08	1.36	21	18	EYZ00DD568C02V
	100000	40 × 70	10.0	6.00	2.00	16	15	EYZ00DG610C02V
	150000	40 × 100	12.9	9.00	3.00	13	12	EYZ00DM615C02V
16	6800	25 × 30	3.11	0.65	0.22	50	37	EYZ00AV468D02V
	10000	25 × 40	4.09	0.96	0.32	36	27	EYZ00AB510D02V
	15000	30 × 40	4.97	1.44	0.48	30	23	EYZ00BB515D02V
	22000	35 × 40	5.53	2.12	0.71	29	22	EYZ00CB522D02V
	33000	35 × 50	6.08	3.17	1.06	28	21	EYZ00CD533D02V
	33000	40 × 40	6.08	3.17	1.06	28	21	EYZ00DB533D02V
	47000	40 × 50	7.46	4.52	1.51	22	18	EYZ00DD547D02V
	68000	40 × 70	9.70	6.53	2.18	17	15	EYZ00DG568D02V
	100000	40 × 100	12.90	9.60	3.20	13	12	EYZ00DM610D02V
25	4700	25 × 30	2.94	0.71	0.24	56	37	EYZ00AV447E02V
	6800	25 × 40	3.93	1.02	0.34	39	27	EYZ00AB468E02V
	10000	30 × 40	4.81	1.50	0.50	32	23	EYZ00BB510E02V
	15000	35 × 40	5.43	2.25	0.75	30	22	EYZ00CB515E02V
	22000	35 × 50	5.98	3.30	1.10	29	21	EYZ00CD522E02V
	22000	40 × 40	5.98	3.30	1.10	29	21	EYZ00DB522E02V
	33000	40 × 50	7.30	4.95	1.65	23	18	EYZ00DD533E02V
	47000	40 × 70	9.43	7.05	2.35	18	15	EYZ00DG547E02V
	68000	40 × 100	12.44	10.20	3.40	14	12	EYZ00DM568E02V
40	2200	25 × 30	2.36	0.53	0.18	87	54	EYZ00AV422G02V
	3300	25 × 40	3.17	0.79	0.27	60	38	EYZ00AB423G02V
	4700	30 × 40	3.93	1.13	0.38	48	33	EYZ00BB447G02V
	6800	35 × 40	4.59	1.63	0.55	42	31	EYZ00CB468G02V
	10000	35 × 50	5.03	2.40	0.80	41	29	EYZ00CD510G02V
	10000	40 × 40	5.03	2.40	0.80	41	29	EYZ00DB510G02V
	15000	40 × 50	6.09	3.60	1.20	33	24	EYZ00DD515G02V
	22000	40 × 70	8.34	5.28	1.76	23	18	EYZ00DG522G02V
	33000	40 × 100	10.97	7.92	2.64	18	15	EYZ00DM533G02V
63	1000	25 × 30	1.55	0.38	0.13	202	155	EYZ00AV410J02V
	1500	25 × 40	2.10	0.57	0.19	137	109	EYZ00AB415J02V
	2200	30 × 40	2.72	0.83	0.28	100	79	EYZ00BB422J02V
	3300	35 × 40	3.44	1.25	0.42	75	61	EYZ00CB433J02V
	4700	35 × 50	4.09	1.78	0.60	62	53	EYZ00CD447J02V
	4700	40 × 40	4.09	1.78	0.60	62	53	EYZ00DB447J02V
	6800	40 × 50	5.10	2.57	0.86	47	40	EYZ00DD468J02V
	10000	40 × 70	6.86	3.78	1.26	34	29	EYZ00DG510J02V
	15000	40 × 100	9.31	5.67	1.89	25	21	EYZ00DM515J02V



Aluminum Capacitors
Power 105 °C Printed Wiring Style

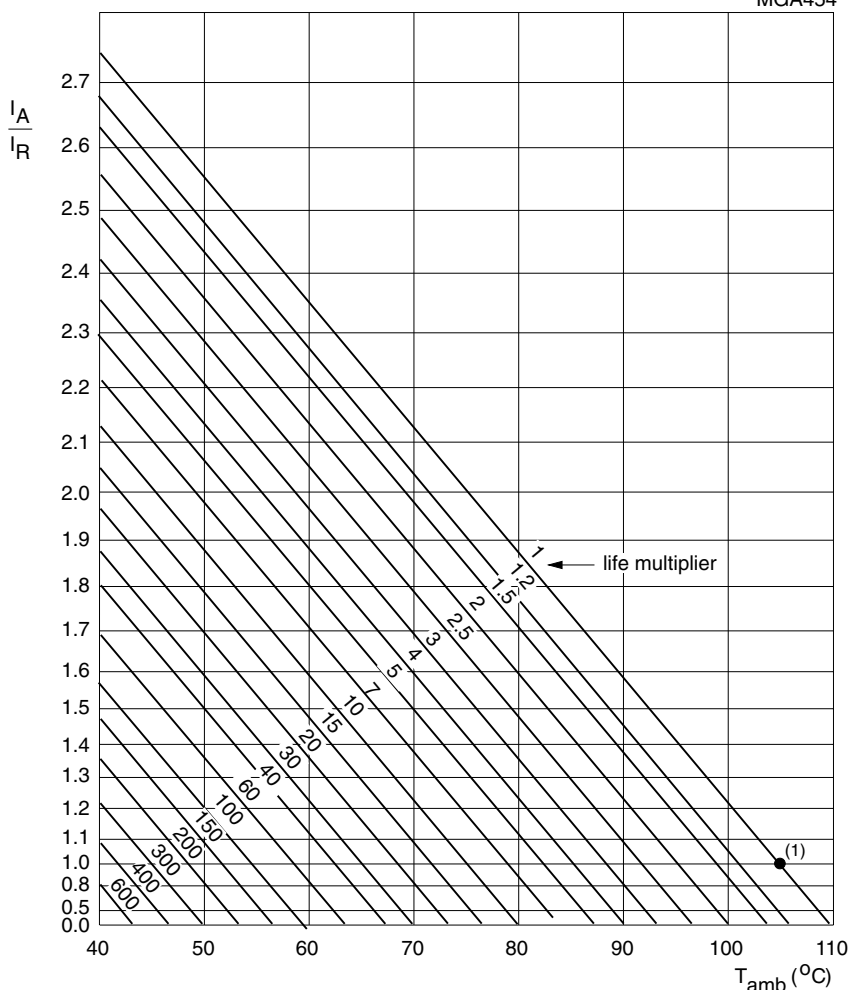
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ELECTRICAL DATA AND ORDERING INFORMATION								
U _R (V)	C _R 100 Hz (µF)	NOMINAL CASE SIZE ∅ D × L (mm)	I _R 100 Hz 105 °C (A)	I _{L1} 1 min (mA)	I _{L5} 5 min (mA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOG NUMBER
100	470	25 × 30	1.42	0.28	0.10	240	155	EYZ00AV347L02V
	680	25 × 40	1.90	0.41	0.14	167	109	EYZ00AB368L02V
	1000	30 × 40	2.48	0.60	0.20	120	79	EYZ00BB410L02V
	1500	35 × 40	3.17	0.90	0.30	88	61	EYZ00CB415L02V
	2200	35 × 50	3.79	1.32	0.44	72	53	EYZ00CD422L02V
	2200	40 × 40	3.79	1.32	0.44	72	53	EYZ00DB422L02V
	3300	40 × 50	4.81	1.98	0.66	53	40	EYZ00DD433L02V
	4700	40 × 70	6.49	2.82	0.94	38	29	EYZ00DG447L02V
6800	40 × 100	8.80	4.08	1.36	28	21	EYZ00DM468L02V	
200	150	25 × 30	0.72	0.18	0.06	950	710	EYZ00AV315S02V
	220	25 × 40	0.96	0.26	0.09	650	485	EYZ00AB322S02V
	330	30 × 40	1.29	0.40	0.14	442	330	EYZ00BB333S02V
	470	35 × 40	1.66	0.57	0.19	321	240	EYZ00CB347S02V
	680	35 × 50	2.09	0.82	0.28	237	185	EYZ00CD368S02V
	680	40 × 40	2.09	0.82	0.28	237	185	EYZ00DB368S02V
	1000	40 × 50	2.71	1.20	0.40	167	133	EYZ00DD410S02V
	1500	40 × 70	3.75	1.80	0.60	114	90	EYZ00DG415S02V
2200	40 × 100	5.24	2.64	0.88	79	62	EYZ00DM422S02V	
250	100	25 × 30	0.67	0.15	0.05	1060	710	EYZ00AV310N02V
	150	25 × 40	0.92	0.22	0.08	710	485	EYZ00AB315N02V
	220	30 × 40	1.28	0.33	0.11	492	330	EYZ00BB322N02V
	330	35 × 40	1.65	0.49	0.17	325	240	EYZ00CB333N02V
	470	35 × 50	2.01	0.70	0.24	256	185	EYZ00CD347N02V
	470	40 × 40	2.01	0.70	0.24	256	185	EYZ00DB347N02V
	680	40 × 50	2.59	1.02	0.34	182	133	EYZ00DD368N02V
	1000	40 × 70	3.58	1.50	0.50	125	90	EYZ00DG410N02V
1500	40 × 100	5.05	2.25	0.75	85	62	EYZ00DM415N02V	
385	68	25 × 30	0.61	0.16	0.06	1650	1260	EYZ00AV268R02V
	100	25 × 40	0.82	0.23	0.08	1120	855	EYZ00AB310R02V
	150	30 × 40	1.10	0.35	0.12	755	580	EYZ00BB315R02V
	220	35 × 40	1.44	0.51	0.17	525	405	EYZ00CB322R02V
	330	35 × 50	1.84	0.77	0.26	360	280	EYZ00CD333R02V
	330	40 × 40	1.84	0.77	0.26	360	280	EYZ00DB333R02V
	470	40 × 50	2.37	1.09	0.36	260	205	EYZ00DD347R02V
	680	40 × 70	3.24	1.58	0.53	180	140	EYZ00DG368R02V
1000	40 × 100	4.54	2.31	0.78	125	100	EYZ00DM410R02V	
400	68	25 × 30	0.39	0.16	0.06	3200	2660	EYZ00AV268X02V
	100	25 × 40	0.53	0.24	0.08	2180	1810	EYZ00AB310X02V
	150	30 × 40	0.72	0.36	0.12	1460	1210	EYZ00BB315X02V
	220	35 × 40	0.94	0.52	0.17	1010	830	EYZ00CB322X02V
	330	35 × 50	1.24	0.79	0.26	680	570	EYZ00CD333X02V
	330	40 × 40	1.24	0.79	0.26	680	570	EYZ00DB333X02V
	470	40 × 50	1.59	1.12	0.37	485	407	EYZ00DD347X02V
	680	40 × 70	2.18	1.63	0.54	336	282	EYZ00DG368X02V
1000	40 × 100	3.07	2.40	0.80	230	193	EYZ00DM410X02V	

ADDITIONAL ELECTRICAL DATA		
PARAMETER	CONDITIONS	VALUE
Voltage		
Surge voltage	≤ 200 V versions	U _s = 1.15 × U _R
	≥ 385 V versions	U _s = 1.1 × U _R
Reverse voltage		U _{rev} ≤ 1 V
Current		
Leakage current	after 1 minute at U _R	I _{L1} ≤ 0.006 C _R × U _R + 4 µA
	after 5 minutes at U _R	I _{L5} ≤ 0.002 C _R × U _R + 4 µA
Inductance		
Equivalent series inductance (ESL)	case ∅ D = 25 mm	max. 25 nH
	case ∅ D = 30 and 35 mm	max. 30 nH
	case ∅ D = 40 mm	max. 35 nH

RIPPLE CURRENT AND USEFUL LIFE

MGA454



I_A = actual ripple current at 100 Hz.

I_R = rated ripple current at 100 Hz and 105 °C.

(1) Useful life at 105 °C and I_R applied: 5000 hours.

Multiplier of useful life as a function of ambient temperature and ripple current load.

MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY			
FREQUENCY (Hz)	I_R MULTIPLIER		
	$U_R = 10$ to 25 V	$U_R = 40$ to 100 V	$U_R = 200$ to 400 V
50	0.93	0.91	0.86
100	1.00	1.00	1.00
200	1.04	1.05	1.13
400	1.07	1.09	1.21
1000	1.11	1.13	1.29
2000	1.13	1.15	1.32
4000	1.15	1.18	1.35
≥ 10000	1.18	1.22	1.40

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TEST PROCEDURES AND REQUIREMENT			
TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Endurance	IEC 60384-4/ EN130300 subclause 4.13	$T_{amb} = 105\text{ °C}$; U_R applied; 2000 hours	$U_R \leq 100\text{ V}$; $\Delta C/C: \pm 15\%$ $U_R > 100\text{ V}$; $\Delta C/C: \pm 10\%$ $ESR \leq 1.3 \times \text{spec. limit}$ $Z \leq 2 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$
Useful life	CECC 30301 subclause 1.8.1	$T_{amb} = 105\text{ °C}$; U_R and I_R applied; 5000 hours	$U_R \leq 100\text{ V}$; $\Delta C/C: \pm 45\%$ $U_R > 100\text{ V}$; $\Delta C/C: \pm 30\%$ $ESR \leq 3 \times \text{spec. limit}$ $Z \leq 3 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$ no short or open circuit, no visible damage total failure percentage: $U_R \leq 100\text{ V}: \leq 1\%$; $U_R > 100\text{ V}: \leq 3\%$
Shelf life (storage at high temperature)	IEC 60384-4/ EN130300 subclause 4.17	$T_{amb} = 105\text{ °C}$; no voltage applied; 500 hours after test: U_R to be applied for 30 minutes, 24 to 48 hours before measurement	$\Delta C/C: \pm 10\%$ $ESR \leq 1.2 \times \text{spec. limit}$ $I_{L5} \leq 2 \times \text{spec. limit}$



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