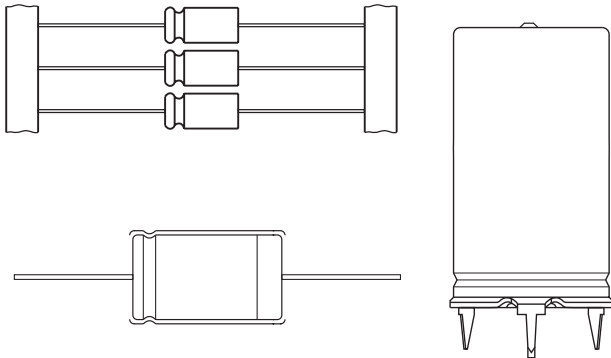


Aluminum Capacitors Axial and Mounting Ring Capacitor Style



Component outlines.

FEATURES

- Polarized aluminum electrolytic capacitors
- High ripple current capability
- Very long lifetime
- Charge/discharge proof
- Extended temperature range: 125 °C
- Mounting Ring available

APPLICATIONS

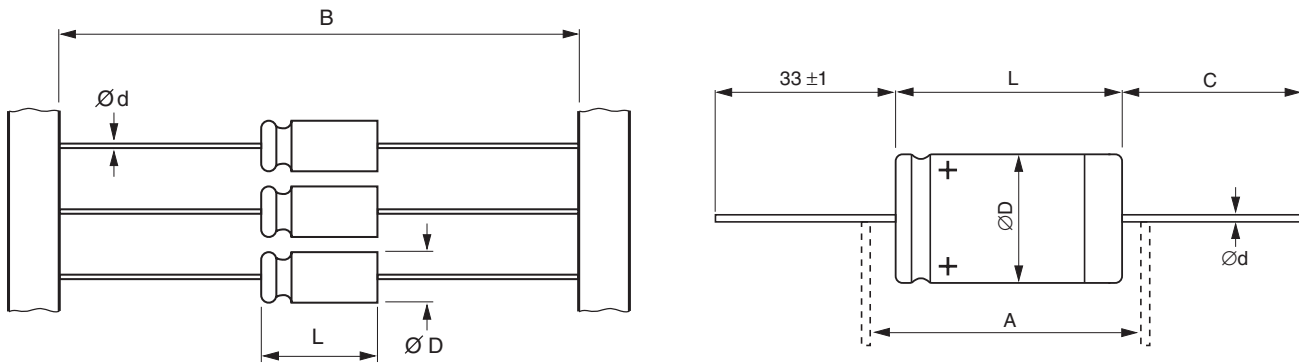
- Industrial and automotive electronics, telecommunication, power supply units
- Coupling, smoothing, filtering, buffering and timing

QUICK REFERENCE DATA					
DESCRIPTION	UNIT	LOW VOLTAGE		HIGH VOLTAGE	
Nominal case size (∅D × L)	mm	6.5 × 18 to 10 × 25	12 × 30 to 21 × 40	6.5 × 18 to 10 × 25	12 × 30 to 21 × 40
Rated capacitance range C _R	μF	1 - 1500	68 - 10000	4.7 - 10	22 - 100
Capacitance tolerance	%	± 20			
Rated voltage range	V	6.3 to 100		200	
Category temperature range	°C	- 40 to 125	- 55 to 125	- 40 to 125	- 55 to 125
Endurance test at 125 °C	h	2000	3000	2000	3000
Useful life at 125 °C and I _R applied	h	4000	8000	4000	8000
Useful life at 85 °C and I _R applied	h	11000	18000	11000	14000
Useful life at 40 °C, 1.8 × I _R applied	h	500000	1000000	500000	1000000
Shelf Life (0 V, 125 °C)	h	100			
Failure rate (0.8 U _R , 40 °C)	10 ⁻⁹ /h	≤ 14	≤ 8	≤ 14	≤ 10
Based on sectional specification		IEC 60384-4, EN130300			
Endurance test at 150 °C	h	500		-	
Climatic category IEC 60 068		40/125/56			

SELECTION CHART FOR C _R , U _R AND RELEVANT NOMINAL CASE SIZES (∅D × L in mm)								
C _R (μF)	U _R (V)							
	6.3	10	16	25	40	63	100	200
1	-	-	-	-	-	6.5 × 18	-	-
2.2	-	-	-	-	-	6.5 × 18	-	-
4.7	-	-	-	-	-	6.5 × 18	6.5 × 18	8 × 18
10	-	-	-	-	-	6.5 × 18	6.5 × 18	10 × 25
22	-	-	EBL		-	6.5 × 18	8 × 18	12 × 30
33	-	-			-	6.5 × 18	10 × 25	15 × 30
47	-	-	-	-	6.5 × 18	8 × 18	10 × 25	18 × 30
68	-	-	-	-	8 × 18	10 × 18	12 × 30	18 × 38
100	-	-	-	6.5 × 18	8 × 18	10 × 25	12 × 30	21 × 38
150	-	-	6.5 × 18	8 × 18	10 × 18	12 × 30	15 × 30	-

SELECTION CHART FOR C _R , U _R AND RELEVANT NOMINAL CASE SIZES (∅D × L in mm)								
C _R (μF)	U _R (V)							
	6.3	10	16	25	40	63	100	200
220	-	6.5 × 18	8 × 18	10 × 18	10 × 25	12 × 30	18 × 30	-
330	-	8 × 18	10 × 18	10 × 25	12 × 30	15 × 30	18 × 38	-
470	-	8 × 18	10 × 18	10 × 25	12 × 30	18 × 30	21 × 38	-
680	-	10 × 18	10 × 25	12 × 30	15 × 30	18 × 38	-	-
1000	10 × 18	10 × 25	12 × 30	12 × 30	18 × 30	21 × 38	-	-
1500	10 × 25	12 × 30	12 × 30	15 × 30	18 × 38	-	-	-
2200	-	12 × 30	15 × 30	18 × 30	21 × 38	-	-	-
3300	-	15 × 30	18 × 30	18 × 38	-	EGL		-
4700	-	18 × 30	18 × 38	21 × 38	-			-
4800	-	18 × 38	21 × 38	-	-	-	-	-
10000	-	21 × 38	-	-	-	-	-	-

DIMENSIONS in millimeters **AND AVAILABLE FORMS**



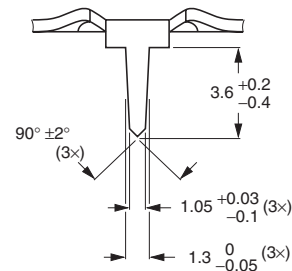
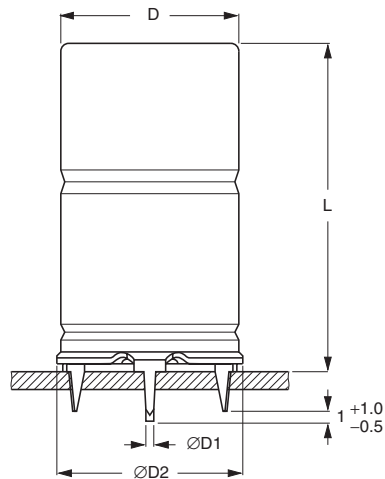
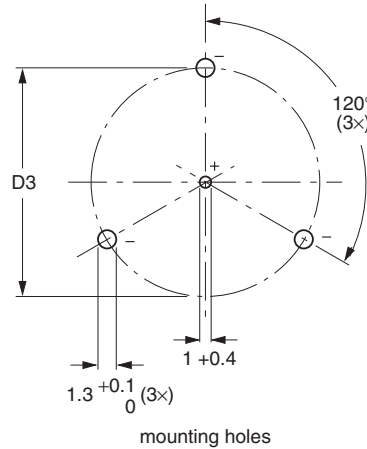
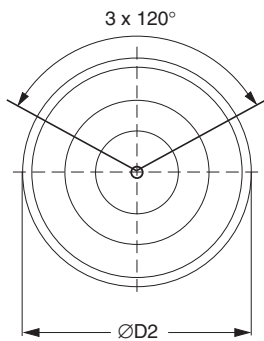
AXIAL STYLE: DIMENSIONS in millimeters, MASS, PACKAGING QUANTITIES AND ORDERING CODE													
NOMINAL CASE SIZE ∅D × L	∅d	C	∅D MAX.	L MAX.	A MIN.	B	MASS APPROX. g	PACKAGING, ENDING OF ORDERING CODE, QUANTITIES					
								BULK IN BOX		TAPED ON REEL		TAPED AMMO	
								CODE	PCS.	CODE	PCS.	CODE	PCS.
6.5 × 18	0.8	-	6.9	18.5	25	73.0 ± 1.6	1.3	-	..A0V	1000	..B0V	1000	
8 × 18	0.8	-	8.5	18.5	25	73.0 ± 1.6	1.7	-	..A0V	500	..B0V	500	
10 × 18	0.8	-	10.5	18.5	25	73.0 ± 1.6	25	-	..A0V	500	..B0V	500	
10 × 25	0.8	-	10.5	25.0	30	73.0 ± 1.6	3.3	-	..A0V	500	..B0V	500	
12 × 30	0.8	55	12.5	30.5	35	73.0 ± 1.6	6	..00 V	260	..A0V	400	n.a	
15 × 30	0.8	55	15.5	30.5	35	73.0 ± 1.6	8	..00 V	300	..A0V	250	n.a	
18 × 30	0.8	55	18.5	30.5	35	73.0 ± 1.6	10	..00 V	200	..A0V	200	n.a	
18 × 38	0.8	34	18.5	40.0	45	-	15	..00 V	120	n.a	n.a	n.a	
21 × 38	0.8	34	21.5	40.0	45	-	21	..00 V	100	n.a	n.a	n.a	

Axial style capacitors are insulated

Aluminum Capacitors
Axial and Mounting Ring Capacitor Style

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MOUNTING RING STYLE: DIMENSIONS in millimeters, MASS, PACKAGING QUANTITIES AND ORDERING CODE										
NOMINAL CASE SIZE $\varnothing D \times L$	$\varnothing D1$	$\varnothing D2$ MAX.	$\varnothing D3 \pm 0.2$	L MAX.	MASS APPROX. g	STARTING OF ORDERING CODE	ENDING OF ORDERING CODE			PACKAGING QUANTITY pcs.
							KIND OF INSULATION			
							NO	SLEEVE	FULL	
15 × 30	0.8	17.5	16.5	33	10	EGL03..	..00V	..01V	..02V	200
18 × 30	0.8	19.5	18.5	33	12	EGL03..	..00V	..01V	..02V	240
18 × 38	0.8	19.5	18.5	41	17	EGL03..	..00V	..01V	..02V	100
21 × 38	0.8	22.5	25.0	41	24	EGL03..	..00V	..01V	..02V	100



EGL 03..

Cases of mounting ring style capacitors are not insulated.
Insulation on request.

ELECTRICAL DATA	
SYMBOL	DESCRIPTION
C_R	rated capacitance at 100 Hz
U_R	rated voltage
$\tan \delta$	max. dissipation factor at 100 Hz
R_{ESR}	equivalent series resistance at 100 Hz, (calculated from $\tan \delta$ max and C_R)
Z	impedance at 10 kHz
I_R	rated alternating current (rms) at 100 Hz and upper category temperature
T_{amb}	ambient temperature
T_{uc}	upper category temperature, 125 °C
RH	relative humidity
P	ambient pressure

Note

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

ORDERING EXAMPLE

The following table gives the ordering number for standard version = axial leads, in bulk.

The 5th place of ordering code refers to termination style:
 EGL 00.. 0 = axial leads
 EGL 03.. 3 = mounting ring

The 12th place of ordering code refers to packaging for axial lead capacitors:

EBL00GD310J... = EBL 100 μ F 63 V 10 x 25
 EBL00GD310J00V 0 = in bulk (box)
 EBL00GD310JA0V A = taped on reel
 EBL00GD310JB0V B = taped ammo

Please see tables "Axial Styles" and "Mounting Ring Styles" for available versions.

ELECTRICAL DATA AND ORDERING INFORMATION							
U_R (V)	C_R 100 Hz (μ F)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 100 Hz MAX.	R_{ESR} 100 Hz (Ω)	Z 10 kHz MAX. (Ω)	I_R 100 Hz $T_{uc}, 125\text{ °C}$ (mA)	CATALOG NUMBER
6.3	1000	10 × 18	0.50	0.79	0.80	251	EBL00GL410B00V
	1500	10 × 25	0.50	0.53	0.53	352	EBL00GD415B00V
10	220	6.5 × 18	0.35	2.53	2.10	109	EBL00DL322C00V
	330	8 × 18	0.35	1.69	1.40	150	EBL00FL333C00V
	470	8 × 18	0.35	1.19	1.00	179	EBL00FL347C00V
	680	10 × 18	0.35	0.82	0.80	240	EBL00GL368C00V
	1000	10 × 25	0.35	0.56	0.55	343	EBL00GD410C00V
	1500	12 × 30	0.32	0.34	0.28	740	EBL00HE415C00V
	2200	12 × 30	0.40	0.29	0.27	830	EBL00HE422C00V
	3300	15 × 30	0.40	0.19	0.18	1070	EGL00KE433C00V
	4700	18 × 30	0.46	0.155	0.15	1350	EGL00LE442C00V
	6800	18 × 38	0.53	0.100	0.10	1730	EGL00LG468C00V
10000	21 × 38	0.53	0.084	0.10	1860	EGL00MG510C00V	
16	150	6.5 × 18	0.25	2.65	2.20	100	EBL00DL315D00V
	220	8 × 18	0.25	1.81	1.50	145	EBL00FL322D00V
	330	10 × 18	0.25	1.21	1.20	204	EBL00GL333D00V
	470	10 × 18	0.25	0.85	0.83	243	EBL00GL347D00V
	680	10 × 25	0.22	0.525	0.45	510	EBL00GD368D00V
	1000	12 × 30	0.22	0.345	0.28	720	EBL00HE410D00V
	1500	12 × 30	0.29	0.305	0.27	790	EBL00HE415D00V
	2200	15 × 30	0.29	0.205	0.18	1010	EGL00KE422D00V
	3300	18 × 30	0.34	0.165	0.15	1300	EGL00LE433D00V
	4700	18 × 38	0.34	0.105	0.10	1670	EGL00LG447D00V
6800	21 × 38	0.38	0.088	0.10	1790	EGL00MG468D00V	



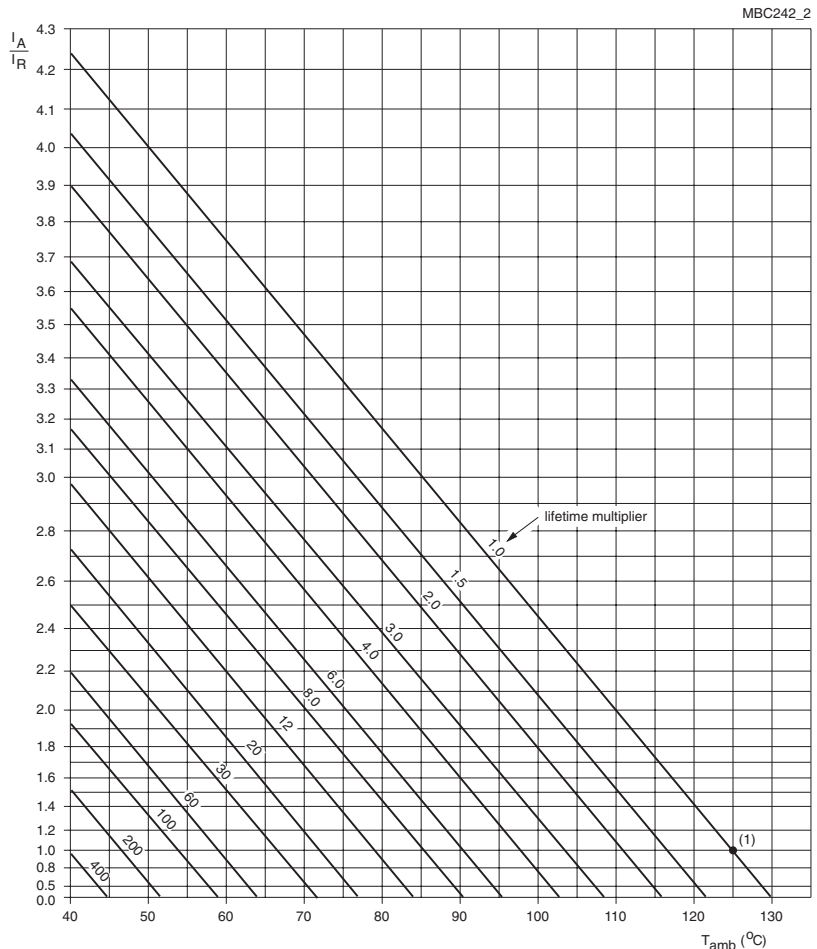
Aluminum Capacitors
Axial and Mounting Ring Capacitor Style

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ELECTRICAL DATA AND ORDERING INFORMATION							
U _R (V)	C _R 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	Tan δ 100 Hz MAX.	R _{ESR} 100 Hz (Ω)	Z 10 kHz MAX. (Ω)	I _R 100 Hz T _{UC} , 125 °C (mA)	CATALOG NUMBER
25	100	6.5 × 18	0.18	2.86	2.30	102	EBL00DL310E00V
	150	8 × 18	0.18	1.91	1.84	145	EBL00FL315E00V
	220	10 × 18	0.18	1.30	1.25	196	EBL00GL322E00V
	330	10 × 25	0.18	0.87	0.82	274	EBL00GD333E00V
	470	10 × 25	0.18	0.61	0.57	327	EBL00GD347E00V
	680	12 × 30	0.18	0.42	0.30	680	EBL00HE368E00V
	1000	12 × 30	0.24	0.375	0.28	760	EBL00HE410E00V
	1500	15 × 30	0.25	0.263	0.22	980	EGL00KE415E00V
	2200	18 × 30	0.26	0.185	0.17	1240	EGL00LE422E00V
	3300	18 × 38	0.26	0.120	0.11	1610	EGL00LG433E00V
4700	21 × 38	0.28	0.095	0.10	1710	EGL00MG447E00V	
40	47	6.5 × 18	0.11	3.72	2.80	90	EBL00DL247G00V
	68	8 × 18	0.11	2.58	1.92	110	EBL00FL268G00V
	100	8 × 18	0.11	1.75	1.30	147	EBL00FL310G00V
	150	10 × 18	0.11	1.17	1.00	207	EBL00GL315G00V
	220	10 × 25	0.11	0.80	0.68	287	EBL00GD322G00V
	330	12 × 30	0.11	0.53	0.33	570	EBL00HE333G00V
	470	12 × 30	0.11	0.38	0.30	620	EBL00HE347G00V
	680	15 × 30	0.11	0.255	0.23	810	EGL00KE368G00V
	1000	18 × 30	0.13	0.205	0.18	1070	EGL00LE410G00V
	1500	18 × 38	0.13	0.130	0.11	1390	EGL00LG415G00V
2200	21 × 38	0.15	0.105	0.10	1540	EGL00MG422G00V	
63	1	6.5 × 18	0.07	110	22	16.4	EBL00DL110J00V
	2.2	6.5 × 18	0.07	51	15	24.3	EBL00DL122J00V
	4.7	6.5 × 18	0.07	24	8.9	35.6	EBL00DL147J00V
	10	6.5 × 18	0.07	11	5.6	51.9	EBL00DL210J00V
	22	6.5 × 18	0.07	5.1	3.2	77	EBL00DL222J00V
	33	6.5 × 18	0.07	2.4	2.2	95	EBL00DL233J00V
	47	8 × 18	0.07	1.1	1.5	126	EBL00FL247J00V
	68	10 × 18	0.07	1.64	1.1	185	EBL00GL268J00V
	100	10 × 25	0.07	1.91	0.7	243	EBL00GD310J00V
	150	12 × 30	0.07	1.00	0.79	490	EBL00HE315J00V
	220	12 × 30	0.08	0.94	0.82	550	EBL00HE322J00V
	330	15 × 30	0.09	0.63	0.56	730	EGL00KE333J00V
	470	18 × 30	0.09	0.44	0.39	970	EGL00LE347J00V
680	18 × 38	0.09	0.30	0.26	1230	EGL00LG368J00V	
1000	21 × 38	0.10	0.16	0.20	1400	EGL00MG410J00V	
100	4.7	6.5 × 18	0.07	24	19	36	EBL00DL147L00V
	10	6.5 × 18	0.07	11	9.0	52	EBL00DL210L00V
	22	8 × 18	0.07	5.1	4.0	91	EBL00FL222L00V
	33	10 × 25	0.07	3.4	2.7	140	EBL00GD233L00V
	47	10 × 25	0.07	2.6	2.0	170	EBL00GD247L00V
	68	12 × 30	0.08	1.8	1.2	320	EBL00HE268L00V
	100	12 × 30	0.09	1.4	1.15	380	EBL00HE310L00V
	150	15 × 30	0.10	0.94	0.78	500	EGL00KE315L00V
	220	18 × 30	0.10	0.66	0.55	690	EGL00LE322L00V
	330	18 × 38	0.10	0.45	0.37	890	EGL00LG333L00V
470	21 × 38	0.10	0.33	0.28	1050	EGL00MG347L00V	
200	4.7	8 × 18	0.06	21	11	46	EBL00FL147S00V
	10	10 × 25	0.06	9.4	5.0	85	EBL00GD210S00V
	22	12 × 30	0.05	3.62	2.22	210	EBL00HE222S00V
	33	15 × 30	0.05	2.42	1.11	290	EGL00KE233S00V
	47	18 × 30	0.05	1.69	0.60	390	EGL00LE247S00V
	68	18 × 38	0.05	1.17	0.42	500	EGL00LG268S00V
	100	21 × 38	0.05	0.80	0.30	610	EGL00MG310S00V

Aluminum Capacitors
Axial and Mounting Ring Capacitor Style

ADDITIONAL ELECTRICAL DATA			
PARAMETER	CONDITIONS	VALUE	
		AXIAL	MOUNTING RING
Voltage			
Surge voltage		$U_s \leq 1.15 \times U_R$	
Reverse voltage		$U_{rev} \leq 1 V$	
Current			
Leakage current	after 1 minute at U_R	$I_{L1} \leq 0.006 C_R \times U_R + 4 \mu A$ or $20 \mu A$ (whichever is greater)	
	after 5 minutes at U_R	$I_{L5} \leq 0.002 C_R \times U_R + 4 \mu A$	
Inductance			
Equivalent series inductance (ESL)	case $\varnothing D \times L$ mm:		
	6.5 × 18	typ. 15 nH	–
	8 × 18	typ. 35 nH	–
	10 × 18	typ. 69 nH	–
	10 × 25	typ. 38 nH	–
	10 × 30	typ. 38 nH	–
	12.5 × 30	typ. 46 nH	–
	15 × 30	typ. 48 nH	typ. 39 nH
	18 × 30	typ. 50 nH	typ. 39 nH
	18 × 38	typ. 54 nH	typ. 39 nH
	21 × 38	typ. 59 nH	typ. 39 nH



I_A = actual ripple current at 100 Hz.
 I_R = rated ripple current at 100 Hz, 125 °C.
 (1) Useful life at 125 °C and I_R applied:
 case $\varnothing D \times L = 6.5 \times 18$ to 10×25 mm: 4000 hours
 case $\varnothing D \times L = 10 \times 30$ to 21×40 mm: 8000 hours.

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



Aluminum Capacitors
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MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY			
FREQUENCY (Hz)	I_R MULTIPLIER		
	$U_R = 6.3$ to 25 V	$U_R = 40$ to 63 V	$U_R = 100$ to 200 V
50	0.95	0.90	0.85
100	1.00	1.00	1.00
300	1.07	1.12	1.20
1000	1.12	1.20	1.30
3000	1.15	1.25	1.35
≥ 10000	1.20	1.30	1.40

TEST PROCEDURES AND REQUIREMENTS			
TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Endurance	IEC 60384-4/ EN130300 subclause 4.13	$T_{amb} = 125$ °C; U_R applied; case sizes: 6.5×18 to 10×25 mm: 2000 hours; 10×30 to 21×38 mm: 3000 hours	$U_R \leq 6.3$ V; $\Delta C/C$: + 15/- 30 % $U_R > 6.3$ V; $\Delta C/C$: ± 15 % $\tan \delta \leq 1.3 \times$ spec. limit $Z \leq 2 \times$ spec. limit $I_{L5} \leq$ spec. limit
Useful life	CECC 30301 subclause 1.8.1	$T_{amb} = 125$ °C; U_R and I_R applied; case $\varnothing D \times L = 6.5 \times 18$ to 10×25 mm: 4000 hours; case $\varnothing D \times L = 10 \times 30$ to 21×38 mm: 8000 hours	$U_R \leq 6.3$ V; $\Delta C/C$: + 45/- 50 % $U_R > 6.3$ V; $\Delta C/C$: ± 45 % $\tan \delta \leq 3 \times$ spec. limit $Z \leq 3 \times$ spec. limit $I_{L5} \leq$ spec. limit no short or open circuit total failure percentage: ≤ 1 % (200 V ≤ 3 %)
Shelf life (storage at high temperature)	IEC 60384-4/ EN130300 subclause 4.17	$T_{amb} = 125$ °C; no voltage applied; $U_R = 6.3$ to 63 V: 500 hours; $U_R = 100$ and 200 V: 100 hours after test: U_R to be applied for 30 minutes, 24 to 48 hours before measurement	$\Delta C/C$, $\tan \delta$, Z : for requirements see 'Endurance test' above $I_{L5} \leq 2 \times$ spec. limit
Reverse voltage	IEC 60384-4/ EN130300 subclause 4.15	$T_{amb} = 125$ °C: 125 hours at $U = -1$ V followed by 125 hours at U_R	$\Delta C/C$: ± 20 % $\tan \delta \leq$ spec. limit $I_{L5} \leq$ spec. limit