Aluminum Capacitors
Radial Style

FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Radial leads, cylindrical aluminum case
- High CV-product per unit volume
- Temperature range up to 105 °C
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

APPLICATIONS

- General purpose, industrial and audio-video
- Coupling, decoupling, timing, smoothing, filtering, buffering in SMPS
- Portable and mobile equipment

QUICK REFERENCE DATA				
DESCRIPTION	UNIT	VALUE		
Nominal case size (Ø D x L)	mm	5 x 11 to 8 x 11.5	10 x 12.5 to 18 x 40	
Rated capacitance range C_R	µF	2.2 to 22 000		
Capacitance tolerance	%	± 20		
Rated voltage range	V	6.3 to 100	160 to 350	400 to 450
Category temperature range	°C	- 55 to + 105	- 40 to + 105	- 25 to + 105
Load life	h	1000	2000	
Based on sectional specification		IEC 60384-4/EN 130300		
Climatic category IEC 60068		55/105/56	40/105/56	25/105/56

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

C_R (µF)	RATED VOLTAGE (V) (> 100 V see next page)							
	6.3	10	16	25	35	50	63	100
2.2	→	→	→	→	→	→	5 x 11	5 x 11
3.3	→	→	→	→	→	→	5 x 11	5 x 11
4.7	→	→	→	→	→	→	5 x 11	5 x 11
6.8	→	→	→	→	→	→	5 x 11	5 x 11
10	→	→	→	→	→	→	5 x 11	5 x 11
15	→	→	→	→	→	→	5 x 11	6.3 x 11
22	→	→	→	→	→	→	5 x 11	6.3 x 11
33	→	→	→	→	→	5 x 11	6.3 x 11	8 x 11.5
47	→	→	→	→	5 x 11	→	6.3 x 11	10 x 12.5
68	→	→	→	5 x 11	6.3 x 11	→	8 x 11.5	10 x 16
100	→	→	5 x 11	→	6.3 x 11	→	8 x 11.5	10 x 20
150	→	5 x 11	→	6.3 x 11	8 x 11.5	→	10 x 12.5	12.5 x 20
220	→	5 x 11	6.3 x 11	→	8 x 11.5	10 x 12.5	10 x 16	12.5 x 25
330	→	6.3 x 11	→	8 x 11.5	10 x 12.5	10 x 16	10 x 20	16 x 25
470	→	6.3 x 11	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	16 x 25
680	8 x 11.5	→	10 x 12.5	10 x 16	12.5 x 16	12.5 x 20	12.5 x 25	16 x 31.5
1000	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 25	18 x 40
1500	→	10 x 16	12.5 x 16	12.5 x 20	16 x 20	16 x 25	16 x 35.5	-
2200	→	10 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5	16 x 35.5	-
3300	12.5 x 16	12.5 x 20	12.5 x 25	16 x 25	16 x 35.5	16 x 35.5	18 x 40	-
4700	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5	16 x 35.5	-	-	-
6800	12.5 x 25	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-
10 000	16 x 25	16 x 35.5	18 x 35.5	-	-	-	-	-
15 000	16 x 35.5	18 x 35.5	-	-	-	-	-	-
22 000	18 x 40	-	-	-	-	-	-	-

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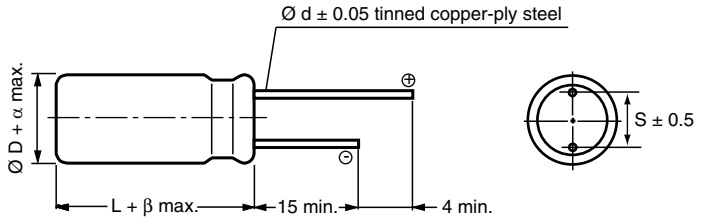
SELECTION CHART FOR C_R, U_R AND RELEVANT NOMINAL CASE SIZES (Ø D x L in mm)

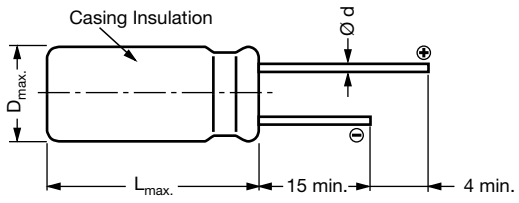
C_R (µF)	RATED VOLTAGE (V)					
	160	200	250	350	400	450
2.2	→	→	6.3 x 11	→	8 x 11.5	10 x 12.5
3.3	→	6.3 x 11	→	8 x 11.5	10 x 12.5	10 x 16
4.7	6.3 x 11	→	8 x 11.5	→	10 x 12.5	10 x 16
6.8	8 x 11.5	→	10 x 12.5	→	10 x 16	10 x 20
10	→	→	10 x 12.5	10 x 16	10 x 20	12.5 x 20
15	→	→	10 x 16	10 x 20	12.5 x 20	12.5 x 25
22	→	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 25
33	→	10 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5
47	→	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5	16 x 35.5
68	12.5 x 25	16 x 20	16 x 25	16 x 31.5	18 x 35.5	18 x 40
100	12.5 x 25	16 x 25	16 x 31.5	18 x 35.5	18 x 40	-
150	16 x 25	16 x 35.5	18 x 35.5	18 x 40	-	-
220	16 x 31.5	18 x 35.5	18 x 40	-	-	-
330	18 x 35.5	18 x 40	-	-	-	-
470	18 x 40	-	-	-	-	-

RADIAL STYLE: DIMENSIONS in millimeters

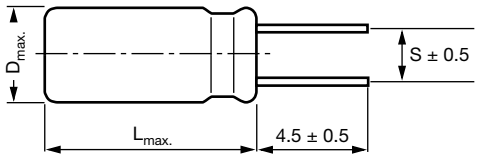


Ø D	5	6.3	8	10	12.5	16	18	22	25
S	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	12.5
Ø d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
β	1.5			2.0					
α	0.5							1.0	

DIMENSIONS in millimeters AND AVAILABLE FORMS



Ø D ≤ 18 long leads MALREKB00...



Ø D ≤ 18 shortened leads MALREKB05...
(S = 2 mm/2.5 mm/3.5 mm/5 mm/7.5 mm)

GENERAL NOTE

- For Minimum Package Quantity (MPQ) and Minimum Order Quantity (MOQ) please refer to our price list or contact customer service.
- For other packaging forms please refer to Vishay Roederstein General Information.

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ELECTRICAL DATA

SYMBOL	DESCRIPTION
U_R	Rated voltage
C_R	Rated capacitance at 120 Hz
tan δ	Max. dissipation factor at 120 Hz
R_{ESR}	Calculated equivalent series resistance at 120 Hz
I_R	Rated ripple current (RMS) at 120 Hz and upper category temperature

Note

- Unless otherwise specified, all electrical values apply at T_a = 20 °C, P = 80 kPa to 120 kPa, RH = 45 % to 75 %

ORDERING EXAMPLE

EKB 3300 µF/25 V, ± 20 %, size: 16 mm x 25 mm

Leads: Long
Ordering code: MALREKB00JG433E00K

Leads: Short
Ordering code: MALREKB05...

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (µF)	DIMENSIONS D x L (mm)	tan δ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 120 Hz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER (Long Leads)
6.3	680	8 x 11.5	0.28	0.55	348	1.10	MALREKB00PB368B00K
	1000	8 x 11.5	0.28	0.37	422	1.10	MALREKB00PB410B00K
	3300	12.5 x 16	0.34	0.14	983	3.00	MALREKB00FD433B00K
	4700	12.5 x 20	0.36	0.10	1219	4.00	MALREKB00FE447B00K
	6800	12.5 x 25	0.40	0.08	1480	5.00	MALREKB00FG468B00K
	10 000	16 x 25	0.46	0.06	1807	8.50	MALREKB00JG510B00K
	15 000	16 x 35.5	0.56	0.05	2233	11.0	MALREKB00JL515B00K
	22 000	18 x 40	0.70	0.04	2652	14.6	MALREKB00KK522B00K
10	150	5 x 11	0.24	2.12	134	0.45	MALREKB00AA315C00K
	220	5 x 11	0.24	1.45	162	0.45	MALREKB00AA322C00K
	330	6.3 x 11	0.24	0.96	228	0.46	MALREKB00BA333C00K
	470	6.3 x 11	0.24	0.68	272	0.46	MALREKB00BA347C00K
	1000	10 x 12.5	0.24	0.32	544	2.05	MALREKB00DC410C00K
	1500	10 x 16	0.26	0.23	680	2.20	MALREKB00DD415C00K
	2200	10 x 20	0.28	0.17	844	3.10	MALREKB00DE422C00K
	3300	12.5 x 20	0.30	0.12	1148	4.00	MALREKB00FE433C00K
	4700	12.5 x 25	0.32	0.09	1421	5.00	MALREKB00FG447C00K
	6800	16 x 25	0.36	0.07	1737	8.50	MALREKB00JG468C00K
	10 000	16 x 35.5	0.42	0.06	2172	11.0	MALREKB00JL510C00K
	15 000	18 x 35.5	0.52	0.05	2482	14.0	MALREKB00KL515C00K
16	100	5 x 11	0.20	2.65	119	0.45	MALREKB00AA310D00K
	220	6.3 x 11	0.20	1.21	203	0.46	MALREKB00BA322D00K
	470	8 x 11.5	0.20	0.56	349	1.10	MALREKB00PB347D00K
	680	10 x 12.5	0.20	0.39	488	2.05	MALREKB00DC368D00K
	1000	10 x 16	0.20	0.27	648	2.20	MALREKB00DD410D00K
	1500	12.5 x 16	0.22	0.19	862	3.00	MALREKB00FD415D00K
	2200	12.5 x 20	0.24	0.14	1055	4.00	MALREKB00FE422D00K
	3300	12.5 x 25	0.26	0.10	1323	5.00	MALREKB00FG433D00K
	4700	16 x 25	0.28	0.08	1657	8.50	MALREKB00JG447D00K
	6800	16 x 31.5	0.32	0.06	1982	10.0	MALREKB00JS468D00K
	10 000	18 x 35.5	0.38	0.05	2409	14.0	MALREKB00KL510D00K

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ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (µF)	DIMENSIONS D x L (mm)	tan δ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 120 Hz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER (Long Leads)
25	68	5 x 11	0.16	3.12	108	0.45	MALREKB00AA268E00K
	150	6.3 x 11	0.16	1.41	185	0.46	MALREKB00BA315E00K
	330	8 x 11.5	0.16	0.64	324	1.10	MALREKB00PB333E00K
	470	10 x 12.5	0.16	0.45	449	2.05	MALREKB00DC347E00K
	680	10 x 16	0.16	0.31	591	2.20	MALREKB00DD368E00K
	1000	10 x 20	0.16	0.21	782	3.10	MALREKB00DE410E00K
	1500	12.5 x 20	0.18	0.16	1017	4.00	MALREKB00FE415E00K
	2200	12.5 x 25	0.20	0.12	1235	5.00	MALREKB00FG422E00K
	3300	16 x 25	0.22	0.09	1562	8.50	MALREKB00JG433E00K
	4700	16 x 31.5	0.24	0.07	1916	10.0	MALREKB00JS447E00K
	6800	18 x 35.5	0.28	0.05	2335	14.0	MALREKB00KL468E00K
35	47	5 x 11	0.14	3.95	96	0.45	MALREKB00AA247F00K
	68	6.3 x 11	0.14	2.73	132	0.46	MALREKB00BA268F00K
	100	6.3 x 11	0.14	1.86	160	0.46	MALREKB00BA310F00K
	150	8 x 11.5	0.14	1.24	231	1.10	MALREKB00PB315F00K
	220	8 x 11.5	0.14	0.84	280	1.10	MALREKB00PB322F00K
	330	10 x 12.5	0.14	0.56	399	2.05	MALREKB00DC333F00K
	470	10 x 16	0.14	0.40	521	2.20	MALREKB00DD347F00K
	680	12.5 x 16	0.14	0.27	740	3.00	MALREKB00FD368F00K
	1000	12.5 x 20	0.14	0.19	974	4.00	MALREKB00FE410F00K
	1500	16 x 20	0.16	0.14	1188	6.00	MALREKB00JE415F00K
	2200	16 x 25	0.18	0.11	1426	8.50	MALREKB00JG422F00K
	3300	16 x 35.5	0.20	0.08	1857	11.0	MALREKB00JL433F00K
	4700	16 x 35.5	0.22	0.06	2224	14.0	MALREKB00JL447F00K
50	33	5 x 11	0.12	4.82	92	0.45	MALREKB00AA233H00K
	220	10 x 12.5	0.12	0.72	376	2.05	MALREKB00DC322H00K
	330	10 x 16	0.12	0.48	504	2.20	MALREKB00DD333H00K
	470	10 x 20	0.12	0.34	657	3.10	MALREKB00DE347H00K
	680	12.5 x 20	0.12	0.23	927	4.00	MALREKB00FE368H00K
	1000	12.5 x 25	0.12	0.16	1226	5.00	MALREKB00FG410H00K
	1500	16 x 25	0.14	0.12	1442	8.50	MALREKB00JG415H00K
	2200	16 x 31.5	0.16	0.10	1442	10.0	MALREKB00JS422H00K
	3300	16 x 35.5	0.18	0.07	1794	11.0	MALREKB00JL433H00K
63	2.2	5 x 11	0.10	60.29	26	0.45	MALREKB00AA122J00K
	3.3	5 x 11	0.10	40.19	32	0.45	MALREKB00AA133J00K
	4.7	5 x 11	0.10	28.22	38	0.45	MALREKB00AA147J00K
	6.8	5 x 11	0.10	19.50	46	0.45	MALREKB00AA168J00K
	10	5 x 11	0.10	13.26	56	0.45	MALREKB00AA210J00K
	15	5 x 11	0.10	8.84	68	0.45	MALREKB00AA215J00K
	22	5 x 11	0.10	6.03	83	0.45	MALREKB00AA222J00K
	33	6.3 x 11	0.10	4.02	116	0.46	MALREKB00BA233J00K
	47	6.3 x 11	0.10	2.82	139	0.46	MALREKB00BA247J00K
	68	8 x 11.5	0.10	1.95	197	1.10	MALREKB00PB268J00K
	100	8 x 11.5	0.10	1.33	239	1.10	MALREKB00PB310J00K
	150	10 x 12.5	0.10	0.88	340	2.05	MALREKB00DC315J00K
	220	10 x 16	0.10	0.60	451	2.20	MALREKB00DD322J00K
	330	10 x 20	0.10	0.40	603	3.10	MALREKB00DE333J00K
	470	12.5 x 20	0.10	0.28	844	4.00	MALREKB00FE347J00K
	680	12.5 x 25	0.10	0.20	1107	5.00	MALREKB00FG368J00K
	1000	16 x 25	0.10	0.13	1490	8.50	MALREKB00JG410J00K
	1500	16 x 35.5	0.12	0.11	1770	11.0	MALREKB00JL415J00K
	2200	16 x 35.5	0.14	0.08	1770	11.0	MALREKB00JL422J00K
	3300	18 x 40	0.16	0.06	2689	14.6	MALREKB00KK433J00K

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ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (µF)	DIMENSIONS D x L (mm)	tan δ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 120 Hz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER (Long Leads)
100	2.2	5 x 11	0.08	48.23	26	0.45	MALREKB00AA122L00K
	3.3	5 x 11	0.08	32.15	32	0.45	MALREKB00AA133L00K
	4.7	5 x 11	0.08	22.58	38	0.45	MALREKB00AA147L00K
	6.8	5 x 11	0.08	15.60	46	0.45	MALREKB00AA168L00K
	10	5 x 11	0.08	10.61	56	0.45	MALREKB00AA210L00K
	15	6.3 x 11	0.08	7.07	78	0.46	MALREKB00BA215L00K
	22	6.3 x 11	0.08	4.82	95	0.46	MALREKB00BA222L00K
	33	8 x 11.5	0.08	3.22	137	1.10	MALREKB00PB233L00K
	47	10 x 12.5	0.08	2.26	190	2.05	MALREKB00DC247L00K
	68	10 x 16	0.08	1.56	251	2.20	MALREKB00DD268L00K
	100	10 x 20	0.08	1.06	332	3.10	MALREKB00DE310L00K
	150	12.5 x 20	0.08	0.71	477	4.00	MALREKB00FE315L00K
	220	12.5 x 25	0.08	0.48	630	5.00	MALREKB00FG322L00K
	330	16 x 25	0.08	0.32	856	8.50	MALREKB00JG333L00K
	470	16 x 25	0.08	0.23	1021	8.50	MALREKB00JG347L00K
	680	16 x 31.5	0.08	0.16	1344	10.0	MALREKB00JS368L00K
	1000	18 x 40	0.08	0.11	1925	14.6	MALREKB00KK410L00K
160	4.7	6.3 x 11	0.15	42.33	34	0.46	MALREKB00BA147M00K
	6.8	8 x 11.5	0.15	29.26	49	1.10	MALREKB00PB168M00K
	68	12.5 x 25	0.15	2.93	273	5.00	MALREKB00FG268M00K
	100	12.5 x 25	0.15	1.99	331	5.00	MALREKB00FG310M00K
	150	16 x 25	0.15	1.33	450	8.50	MALREKB00JG315M00K
	220	16 x 31.5	0.15	0.90	596	10.0	MALREKB00JS322M00K
	330	18 x 35.5	0.15	0.60	822	14.0	MALREKB00KL333M00K
	470	18 x 40	0.15	0.42	1015	14.6	MALREKB00KK347M00K
200	3.3	6.3 x 11	0.15	60.29	29	0.46	MALREKB00BA133S00K
	22	10 x 16	0.15	9.04	111	2.20	MALREKB00DD222S00K
	33	10 x 20	0.15	6.03	149	3.10	MALREKB00DE233S00K
	47	12.5 x 20	0.15	4.23	208	4.00	MALREKB00FE247S00K
	68	16 x 20	0.15	2.93	279	6.00	MALREKB00JE268S00K
	100	16 x 25	0.15	1.99	368	8.50	MALREKB00JG310S00K
	150	16 x 35.5	0.15	1.33	517	11.0	MALREKB00JL315S00K
	220	18 x 35.5	0.15	0.90	671	14.0	MALREKB00KL322S00K
	330	18 x 40	0.15	0.60	850	14.6	MALREKB00KK333S00K
250	2.2	6.3 x 11	0.15	90.43	23	0.46	MALREKB00BA122N00K
	4.7	8 x 11.5	0.15	42.33	40	1.10	MALREKB00PB147N00K
	6.8	10 x 12.5	0.15	29.26	56	2.05	MALREKB00DC168N00K
	10	10 x 12.5	0.15	19.89	68	2.05	MALREKB00DC210N00K
	15	10 x 16	0.15	13.26	92	2.20	MALREKB00DD215N00K
	22	10 x 20	0.15	9.04	121	3.10	MALREKB00DE222N00K
	33	12.5 x 20	0.15	6.03	175	4.00	MALREKB00FE233N00K
	47	12.5 x 25	0.15	4.23	227	5.00	MALREKB00FG247N00K
	68	16 x 25	0.15	2.93	303	8.50	MALREKB00JG268N00K
	100	16 x 31.5	0.15	1.99	402	10.0	MALREKB00JS310N00K
	150	18 x 35.5	0.15	1.33	554	14.0	MALREKB00KL315N00K
	220	18 x 40	0.15	0.90	694	14.6	MALREKB00KK322N00K

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U_R (V)	C_R 120 Hz (µF)	DIMENSIONS D x L (mm)	tan δ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 120 Hz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER (Long Leads)
350	3.3	8 x 11.5	0.20	80.38	34	1.10	MALREKB00PB133O00K
	10	10 x 16	0.20	26.53	75	2.20	MALREKB00DD210O00K
	15	10 x 20	0.20	17.68	100	3.10	MALREKB00DE215O00K
	22	12.5 x 20	0.20	12.06	143	4.00	MALREKB00FE222O00K
	33	12.5 x 25	0.20	8.04	190	5.00	MALREKB00FG233O00K
	47	16 x 25	0.20	5.64	252	8.50	MALREKB00JG247O00K
	68	16 x 31.5	0.20	3.90	332	10.0	MALREKB00JS268O00K
	100	18 x 35.5	0.20	2.65	407	14.0	MALREKB00KL310O00K
	150	18 x 40	0.20	1.77	523	14.6	MALREKB00KK315O00K
400	2.2	8 x 11.5	0.20	120.6	28	1.10	MALREKB00PB122X00K
	3.3	10 x 12.5	0.20	80.38	39	2.05	MALREKB00DC133X00K
	4.7	10 x 12.5	0.20	56.44	47	2.05	MALREKB00DC147X00K
	6.8	10 x 16	0.20	39.01	62	2.20	MALREKB00DD168X00K
	10	10 x 20	0.20	26.53	82	3.10	MALREKB00DE210X00K
	15	12.5 x 20	0.20	17.68	118	4.00	MALREKB00FE215X00K
	22	12.5 x 25	0.20	12.06	155	5.00	MALREKB00FG222X00K
	33	16 x 25	0.20	8.04	211	8.50	MALREKB00JG233X00K
	47	16 x 31.5	0.20	5.64	276	10.0	MALREKB00JS247X00K
	68	18 x 35.5	0.20	3.90	373	14.0	MALREKB00KL268X00K
	100	18 x 40	0.20	2.65	427	14.6	MALREKB00KK310X00K
450	2.2	10 x 12.5	0.20	120.6	27	2.05	MALREKB00DC122P00K
	3.3	10 x 16	0.20	80.38	36	2.20	MALREKB00DD133P00K
	4.7	10 x 16	0.20	56.44	43	2.20	MALREKB00DD147P00K
	6.8	10 x 20	0.20	39.01	56	3.10	MALREKB00DE168P00K
	10	12.5 x 20	0.20	26.53	80	4.00	MALREKB00FE210P00K
	15	12.5 x 25	0.20	17.68	107	5.00	MALREKB00FG215P00K
	22	16 x 25	0.20	12.06	144	8.50	MALREKB00JG222P00K
	33	16 x 31.5	0.20	8.04	193	10.0	MALREKB00JS233P00K
	47	16 x 35.5	0.20	5.64	242	11.0	MALREKB00JL247P00K
	68	18 x 40	0.20	3.90	352	14.6	MALREKB00KK268P00K

LOW TEMPERATURE BEHAVIOR

IMPEDANCE RATIO Z (T2)/Z (T1)	RATED VOLTAGE (V)									
T2/T1	6.3	10	16	25	35	50 ~ 100	160	200 ~ 350	400	450
- 25/+ 20 °C	5	4	3	2	2	2	3	4	6	10
- 40/+ 20 °C	10	8	6	4	3	3	4	8	-	-

ADDITIONAL ELECTRICAL DATA

PARAMETER	CONDITIONS	VALUE		
Current				
Leakage current (test conditions: U_R, 20 °C)	After 1 min at U_R	$I_{L1} \leq 0.03 \times C_R \times U_R$	or 4 µA	for $U_R \leq 100$ V (whichever is greater)
	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)
	After 5 min at U_R	$I_{L5} \leq 0.02 \times C_R \times U_R$	+ 15 µA	for $U_R > 100$ V (whichever is greater)
Resistance				
Equivalent series resistance (ESR)	Calculated from tan $\delta_{max.}$ and C_R	$ESR = \tan \delta / 2 \pi f C_R$		

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MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY			
FREQUENCY (Hz)	I_R MULTIPLIER FOR $U_R \leq 100$ V		
	$C_R \leq 47$ µF	$C_R = 68$ µF to 680 µF	$C_R \geq 1000$ µF
50	0.75	0.80	0.85
120	1.00	1.00	1.00
300	1.35	1.25	1.10
1000	1.55	1.35	1.15
≥ 10 000	2.00	1.50	1.15

MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY		
FREQUENCY (Hz)	I_R MULTIPLIER FOR U_R 160 V to ≤ 450 V	
	$C_R = 47$ µF to 220 µF	$C_R \geq 330$ µF
50	0.80	0.90
120	1.00	1.00
300	1.25	1.10
1000	1.40	1.13
≥ 10 000	1.60	1.15

TEST PROCEDURES AND REQUIREMENTS		
TEST	PROCEDURE (quick reference)	REQUIREMENTS
Load life	T_{amb} = 105 °C U_R and I_R applied After 1000 h Ø 5 mm, Ø 6.3 mm, Ø 8 mm After 2000 h ≥ Ø 10 mm	ΔC/C: ± 25 % of initial value $I_L \leq$ spec. limit tan δ ≤ 2 x spec. limit
Shelf life	T_{amb} = 105 °C No voltage applied After 1000 h After test: U_R to be applied for 30 min 24 h to 48 h before measurement	ΔC/C: ± 20 % of initial value $I_L \leq$ spec.limit tan δ ≤ 2 x spec. limit

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