Roederstein

Low-Voltage Electrolytic Capacitors
Axial, Polarized,
Special Capacitors for Audio-Frequency application
DIN 41237 and 45910, Part 127

EBAZ
EGAZ

The EBAZ / EGAZ types are specialstyles, polarized, with lightly etched anodes. They are expecially suited for application in audio-frequency networks.

Electric values:
DIN 41332 and 41240
DIN 41237 pertinent style standard
DIN 45910 part 127
(without quality certificate)

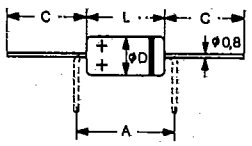
Generic specifications:
DIN 45910 (≙ CECC 30.000)

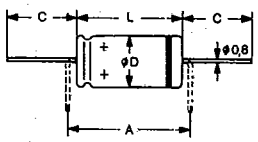
Sectional specifications:
The electric values and test criteria comply with DIN 45910 part 12 and CECC 30.300 however, without quality certificate
IEC 384-4 („long life grade")

Operating temperature range:
–40 ... 105°C

Application class:
G M F

Nominal case dimensions	D * max.	L * max.	A min.	C	Type	Style
8.5 x 17	9	18	25	40_{-5}	EBAZ	
8.5 x 20	9	21.5	25	40_{-5}	EBAZ	
10 x 20	10.5	21.5	25	40_{-5}	EBAZ	
10 x 25	10.5	26.5	30	40_{-5}	EBAZ	
12 x 25	12.5	26.5	30	40_{-5}	EBAZ	
12 x 30	12.5	31.5	35	40_{-5}	EBAZ	
14 x 30	14.5	30.5	35	40_{-5}	EGAZ	
16 x 30	16.5	30.0	35	40_{-5}	EGAZ	
16 x 40	16.5	40.5	45	40_{-5}	EGAZ	
18 x 40	18.5	40.5	45	40_{-5}	EGAZ	
21 x 40	21.5	40.5	45	40_{-5}	EGAZ	
25 x 40	25.5	40.5	45	40_{-5}	EGAZ	
25 x 45	25.5	46.0	50	40_{-5}	EGAZ	





* Insulation included.

The capacitors are delivered with insulation.

Service life at DC voltage and voltages from audio-frequency mixture:

Service life	Ambient temperature	Case diameter 8.5 and 10 mm	Case diameter ≧ 12 mm
At DC voltage and voltages from audio-frequency mixture:	≦ 40°C	min. 120,000 h	min. 200,000 h
	85°C	min. 5,000 h	min. 8,000 h
	105°C	min. 1,500 h	min. 2,000 h

For reference reliability and operational life, see also "General Information".

Climatic category:
40 / 085 / 56

Capacitance tolerance:
± 20 % (reduced ± 15 %)

Leakage current:
$I_{ra} = 0.025 \cdot C_R \cdot U_R$ or 5 µA (C in µF, U in V) for $C \cdot U \leqq 1000$ (the higher value applies)

$I_{ra} = 0.015 \cdot C_R \cdot U_R + 10$ µA for $C \cdot U > 1000$ measured at U_R and 20°C after 5 min.

For leakage current, see also „General Information".

● Not designed for new development:
For equivalents, see type series EBT/EGT

Overview of dimensions: (max. dimensions, insulation included)

Capacitance * (µF)	Rated voltage 40 VDC/15 VAC	63 VDC/23 VAC	100 VDC/35 VAC
2.2	9 x 18	9 x 21.5	● 10.5 x 21.5
3.3	9 x 18	10.5 x 21.5	● 10.5 x 26.5
4.7	9 x 21.5	10.5 x 26.5	● 12.5 x 26.5
6.8	10.5 x 21.5	12.5 x 26.5	● 12.5 x 31.5
10	10.5 x 26.5	12.5 x 31.5	● 16.5 x 30
15	● 12.5 x 26.5	● 16.5 x 30	● 16.5 x 40
22	● 12.5 x 31.5	● 16.5 x 40	● 18.5 x 40
33	● 16.5 x 30	● 18.5 x 40	● 21.5 x 40
47	● 16.5 x 40	● 21.5 x 40	● 25.5 x 40
68	● 18.5 x 40	● 25.5 x 40	
100	● 21.5 x 40	● 25.5 x 51	
150	● 25.5 x 40		

* measured at 1 kHz / 20°C

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Dissapation factor tan δ at 20°C (limit value)

U_R	Frequency in Hz								
in VDC	50	100	200	500	1000	2000	5000	10000	20000
40	0.05	0.06	0.065	0.07	0.08	0.13	0.24	0.40	0.72
63	0.045	0.05	0.06	0.065	0.07	0.12	0.22	0.35	0.64
100	0.04	0.045	0.05	0.06	0.065	0.11	0.21	0.32	0.56

Equivalent series resistance (R_{ESR}) in Ω · µF (limit values)

Rated voltage	Frequency f in Hz								
U_R in VDC	50	100	200	500	1000	2000	5000	10000	20000
40	159	96	52	23	13	11	8	7	6
63	143	80	48	21	11	10	7	6	5
100	127	72	40	19	10	9	7	5	4

ati 20°C; referred to 1 µF.

Impedance (Z) in Ω · µF (limit values) *

Rated voltage	Temperature	Frequency f in Hz										
U_R in VDC	°C	50	100	200	500	1000	2000	5000	10000	20000	50000	100000
40	20	4000	2000	1000	400	200	100	40	22	15	8	6
	–25	4000	2000	1000	480	250	125	65	50	44	42	42
	–40	4400	2200	1200	550	320	200	140	120	105	100	100
63	20	4000	2000	1000	400	200	100	40	21	14	8	6
	–25	4000	2000	1000	480	250	125	65	50	44	42	42
	–40	4400	2200	1200	550	320	200	140	120	105	100	100
100	20	4000	2000	1000	400	200	100	40	20	13	8	6
	–25	4000	2000	1000	480	250	125	65	50	44	42	42
	–40	4400	2200	1200	550	320	200	140	120	105	100	100

referred to 1 µF.

* If the received capacitance is at the lower tolerance limit, the indicaded limit values may increase by approx. 20 %.

Voltage endurance test:
(also applies to type series EBT / EGT)
Endurance test of aluminium electrolytic capacitors suited for AC loading without polarization DC voltage.
The method for testing aluminium electrolytic capacitors as to AC loading considerably deviates from the data given in the sectional specifications, since the capacitors mentioned here are submitted to essentially different operating conditions than are common to aluminium electrolytic capacitors.
The specification provided for the endurance test of aluminium electrolytic capacitors therefore incorporates the following special tests:
1. Endurance test with sine-wave voltage of 50 Hz;
2. Shelf-life at increased ambient temperature.

1. Endurance thest with sine-wave voltage of 50 Hz:
1.1 Load with the max. admissible sine-wave current of 50 Hz according to the table. This sine-wave current causes a voltage drop on the test object of up to the admissible sine-wave voltage.
1.2 Ambient temperature 40°C ± 2°C.
1.3 Duration of load 1,000 hours.
1.4 Criteria:
Modification of capacitance ≤ 10 % with respect to the initial value, dissipation factor (1 Hz): double limit value acc. to the table
Impedance (10 kHz):
1.5 times the limit value acc. to the table.

2. Shelf-life at increased ambient temperature:
2.1 Shelf-life at an ambient temperature of 85°C ± 2°C.
2.2 Shelf-life period 500 hours
2.3 Criteria as section 1.4.
Leakage current:
≤ 10 times the limit value acc. to the table.

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Admissible ripple current, in marms at bei 85°C:

U_R (VDC)	Admissible AC voltage (V_{eff})	C_R (in µF, at 20°C and 1 kHz)	Admissible ripple current (in marms, at 85°C)								
			50 Hz	100 Hz	200 Hz	500 Hz	1 kHz	2 kHz	5 kHz	10 kHz	20 kHz
40	15	2.2	16	25	34	53	73	85	98	110	120
		3.3	23	31	42	65	90	110	120	140	150
		4.7	29	39	53	82	110	130	150	180	190
		6.8	38	50	69	100	150	170	200	230	240
		10	50	66	91	140	190	230	260	300	320
		15	72	110	140	250	290	320	370	410	430
		72	110	140	190	290	380	420	490	530	560
		33	150	190	260	400	530	590	680	750	790
		47	200	260	350	530	700	780	910	1000	1100
		68	260	330	450	680	900	1000	1200	1300	1400
		100	330	420	570	870	1100	1300	1500	1600	1700
		150	450	580	800	1200	1600	1800	2100	2300	2400
63	23	2.2	21	27	37	57	79	93	110	130	140
		3.3	27	36	49	76	110	120	140	170	180
		4.7	36	47	64	100	140	160	190	220	230
		6.8	48	64	87	130	180	220	250	300	310
		10	63	83	110	170	240	280	330	380	400
		15	100	140	180	280	380	410	480	540	560
		22	140	190	250	380	520	560	650	730	760
		33	190	250	330	500	670	730	850	950	1000
		47	240	320	410	620	850	810	1100	1200	1300
		68	320	430	560	850	1200	1300	1500	1600	1700
		100	420	570	740	1100	1500	1600	1900	2200	2300
100	35	2.2	23	31	42	64	88	100	120	140	150
		3.3	31	41	56	85	120	140	160	190	200
		4.7	42	55	75	115	160	190	210	260	270
		6.8	54	71	97	150	200	240	280	330	350
		10	75	98	130	200	280	340	380	460	490
		15	130	170	230	330	440	480	550	630	670
		22	170	220	290	420	570	620	710	810	870
		33	210	280	380	540	740	800	910	1000	1100
		47	280	380	510	740	1000	1100	1300	1400	1500

See "General Information" for the admissible AC loading in dependence on the ambient temperature.

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Technical specifications: (individual values)

Rated capacitance (µF)	Rated voltage (VDC)	Admissible AC voltage (V_{rms})	Dimensions D x L (mm) (nominal dimensions)	tan δ (1 kHz; 20°C) (limit values)	R_{ESR} (Ω) (1 kHz; 20°C) (limit values)	Z (Ω) (10 kHz; 20°C) (limit values) *	Weight (g)	Order no.	
2.2	40	15	8.5 x 17	0.08	5.8	10	1.8	EB 10 FB 122	G
3.3	40	15	8.5 x 17	0.08	3.8	6.7	1.8	EB 10 FB 133	G
4.7	40	15	8.5 x 20	0.08	2.7	4.7	2.3	EB 10 FC 147	G
6.8	40	15	10 x 20	0.08	1.9	3.2	3.1	EB 10 GC 168	G
10	40	15	10 x 25	0.08	1.3	2.2	3.5	EB 10 GD 210	G
15	40	15	12 x 25	0.08	0.85	1.5	4.5	EB 10 HD 215	G
22	40	15	12 x 30	0.08	0.58	1.0	5.5	EB 10 HE 222	G
33	40	15	16 x 30	0.08	0.38	0.67	10	EG 10 KE 233	G
47	40	15	16 x 40	0.08	0.27	0.47	13	EG 10 KG 247	G
68	40	15	18 x 40	0.08	0.19	0.32	16	EG 10 LG 268	G
100	40	15	21 x 40	0.08	0.13	0.22	20	EG 10 MG 310	G
150	40	15	25 x 40	0.08	0.08	0.15	28	EG 10 NG 315	G
2.2	63	23	8.5 x 20	0.07	5.0	9.5	2.3	EB 10 FC 122	J
3.3	63	23	10 x 20	0.07	3.4	6.4	3.1	EB 10 GC 133	J
4.7	63	23	10 x 25	0.07	2.4	4.5	3.5	EB 10 GD 147	J
6.8	63	23	12 x 25	0.07	1.6	3.1	4.5	EB 10 HD 168	J
10	63	23	12 x 30	0.07	1.1	2.1	5.5	EB 10 HE 210	J
15	63	23	16 x 30	0.07	0.74	1.4	10	EG 10 KE 215	J
22	63	23	16 x 40	0.07	0.50	0.95	13	EG 10 KG 222	J
33	63	23	18 x 40	0.07	0.34	0.64	16	EG 10 LG 233	J
47	63	23	21 x 40	0.07	0.24	0.45	20	EG 10 MG 247	J
68	63	23	25 x 40	0.07	0.16	0.31	28	EG 10 NG 268	J
100	63	23	25 x 45	0.07	0.11	0.21	30	EG 10 NH 310	J
2.2	100	35	10 x 20	0.065	4.7	9.1	3.1	EB 10 GC 122	L
3.3	100	35	10 x 25	0.065	3.2	6.1	3.5	EB 10 GD 133	L
4.7	100	35	12 x 25	0.065	2.2	4.3	4.5	EB 10 HD 147	L
6.8	100	35	12 x 30	0.065	1.5	2.9	5.5	EB 10 HE 168	L
10	100	35	16 x 30	0.065	1.04	2.0	10	EG 10 KE 210	L
15	100	35	16 x 40	0.065	0.69	1.3	13	EG 10 KG 215	L
22	100	35	18 x 40	0.065	0.47	0.91	16	EG 10 LG 222	L
33	100	35	21 x 40	0.065	0.32	0.61	20	EG 10 MG 233	L
47	100	35	25 x 40	0.065	0.22	0.43	28	EG 10 NG 247	L

* If the received capacitance is at the lower tolerance limit, the indicated values may increase by approx. 20 %.

☐ Not suited for new development – for equivalents, see type series EBT/EGT.

Ordering example:
EBAZ 10 / 63, dim. 12 x 30
EB 10 HE 210 J

Capacitors up to ø 21 mm are also available for vertical mounting with bent negative lead (cf. EBK / EGK).