Roederstein

Low-Voltage Electrolytic Capacitors
Axial, Bipolar,
Special Capacitors for Audio-Frequency application
DIN 41236 and DIN 45910 Part 125

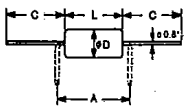
EBT
EGT

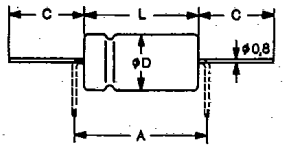
Capacitors of the EBT / EGT type are special styles for audio-frequency application and a further development of the polarized audio-frequency capacitors of the EBAZ / EGAZ type. They are bipolar and have a very favourable behaviour of the equivalent series resistance R_{ESR}, a high capacitance stability and operational reliability.
Their dimensions could be reduced as compared with the type series EBAZ / EGAZ.
A continuous load with a sine-wave voltage of 50 Hz is admissible for at least 2,000 hours at 40°C.
For voltage endurance test, see type series EBAZ / EGAZ.

Please observe the following when using the capacitors:

1. The sum voltage on the applied DC voltage and the peak value of the AC voltage must not exceed the indicated rated DC voltage.
2. The peak value of the AC voltage must not exceed 42 V_{pp} for U_R = 40 VDC, 64 V_{pp} for U_R = 63 VDC And 100 V_{PP} for U_R = 100 VDC. The values apply to frequencies from 50 to 100 Hz. For deviating frequencies, please observe the current limitation according to the table. This condition is not influenced by an additional polarization voltage.
3. The AC should be limited in such a way that the self-heating of the capacitor surface does not exceed 15 K. This value is referred to an ambient temperature of ≦ 40°C.

Nominal case dimensions	D * max.	L * max.	A min.	C	Typ	Bauform
8.5 x 17	9	18	20	40_{-5}	EBT	
8.5 x 20	9	21.5	25	40_{-5}	EBT	
10 x 20	10.5	21.5	25	40_{-5}	EBT	
10 x 25	10.5	26.5	30	40_{-5}	EBT	
12 x 25	12.5	26.5	30	40_{-5}	EBT	
12 x 30	12.5	31.5	35	40_{-5}	EBT	
14 x 30	14.5	30.5	35	40_{-5}	EGT	
16 x 30	16.5	30.0	35	40_{-5}	EGT	
16 x 40	16.5	40.0	45	40_{-5}	EGT	
18 x 40	18.5	40.0	45	40_{-5}	EGT	
21 x 40	21.5	40.0	45	40_{-5}	EGT	
25 x 40	25.5	40.0	45	40_{-5}	EGT	
25 x 45	25.5	46.0	50	40_{-5}	EGT	





* Insulation included.
The capacitors are delivered with insulation.

Electric values:
DIN 41332 and 41240
DIN 41236 pertinent style standard
DIN 45910 part 125
(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 30300, however, without quality certificate
IEC 384-4 („long life grade")

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

Application class:
G M F

Climatic category:
40 / 100 / 56

Capacitance tolerance
± 15 % (reduced: ± 10 %)

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

$I_{ra} \leqq 0.015 \cdot C_R \cdot U_R + 10$ µA
for $C \cdot U > 1000$
measured at U_R and 20°C after 5 min.
(negative pole on the case side)

For leakage current, see also "General Information".

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

Ambient temperature	Case diameter 8.5 and 10 mm	Case diameter ≧ 12 mm
≦ 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 service life, see also "General Information".

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Overview of dimensions:
(max. dimensions)
* The capacitance of these capacitors is measured a 1 KHz / 20°C.

Special values on request.

Capacitance * (µF)		Ratede voltage 40 VDC/15 VAC	63 VDC/23 VAC	100 VDC/35 VAC
2.2		9 x 18	9 x 18	9 x 21.5
3.3		9 x 18	9 x 21.5	10.5 x 21.5
4.7		9 x 18	10.5 x 21.5	10.5 x 21.5
6.8	**EBT**	9 x 21.5	10.5 x 26.5	12.5 x 26.5
10		10.5 x 21.5	12.5 x 26.5	12.5 x 31.5
15		10.5 x 26.5	12.5 x 31.5	16.5 x 30
22		12.5 x 26.5	14.5 x 30.5	16.5 x 40
33		12.5 x 31.5	16.5 x 40	18.5 x 40
47		14.5 x 30.5	18.5 x 40	21.5 x 40
68	**EGT**	16.5 x 30	21.5 x 40	25.5 x 40
100		16.5 x 40	25.5 x 40	25.5 x 46

Dissipation factor tan δ at 20°C
(limit values)

DC voltage in V	Capacitance in µF	Frequency in Hz 50	100	200	500	1000	2000	5000	10000	20000
40	≦ 10	0.07	0.08	0.085	0.09	0.095	0.14	0.27	0.40	0.72
	> 10	0.05	0.06	0.065	0.07	0.08	0.13	0.24	0.40	0.72
63	≦ 10	0.065	0.075	0.08	0.085	0.09	0.13	0.24	0.35	0.64
	> 10	0.045	0.05	0.06	0.065	0.07	0.12	0.22	0.35	0.64
100	≦ 10	0.06	0.07	0.075	0.08	0.085	0.12	0.23	0.32	0.56
	> 10	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 at 20°C (limit values) *
referred to 1 µF.

DC voltage in V	Capacitance in µF	Frequency in Hz 50	100	200	500	1000	2000	5000	10000	20000
		R_{ESR} in Ω · µF								
40	≦ 10	223	127	68	29	15	11	9	7	6
	> 10	159	96	52	22	13	10	8	7	6
63	≦ 10	207	120	64	27	14	10	8	6	5
	> 10	143	80	48	21	11	10	7	6	5
100	≦ 10	191	111	60	26	14	10	8	6	5
	> 10	127	72	40	19	10	9	7	5	5

Impedance Z in Ω · µF
(limit values) *
referred to 1 µF.
* If the received capacitance is at the lower tolerance limit, the indicated limit values may increase by approx. 15 %.

Rated vol. in V	Temper. in °C	Frequency in Hz 50	100	200	500	1000	2000	5000	10000	20000	50000	100000
		Z in Ω · µF										
40	20	4000	2000	1000	400	220	100	40	22	15	8	6
	–25	4000	2000	1000	480	270	160	95	70	58	51	50
	–40	4400	2200	1200	550	360	320	280	250	230	210	190
63	20	4000	2000	1000	400	210	100	40	21	14	8	6
	–25	4000	2000	1000	480	260	140	80	60	50	49	46
	–40	4400	2200	1200	550	340	290	240	210	190	170	155
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	260	200	170	150	140	130

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Admissible ripple current in marms at 85°C

Rated capac.	Rated volt.	Frequency in Hz								
(µF)	U_R in V	50	100	200	500	1000	2000	5000	10000	≧20000
2.2	40	10	20	39	59	82	95	110	130	130
3.3	40	15	29	47	73	100	120	130	150	160
4.7	40	21	41	56	87	120	140	160	180	190
6.8	40	30	52	71	110	150	180	200	230	250
10	40	44	68	93	140	200	230	260	300	320
15	40	67	100	140	220	290	320	370	410	430
22	40	98	140	190	300	390	430	510	550	580
33	40	150	190	260	390	520	570	670	730	770
47	40	190	240	330	510	670	740	860	950	1000
68	40	240	310	420	640	850	940	1100	1200	1300
100	40	330	420	570	870	1100	1300	1500	1600	1700
2.2	63	15	29	40	61	84	99	110	130	140
3.3	63	23	37	51	79	110	130	150	170	180
4.7	63	33	48	66	100	140	160	190	220	230
6.8	63	48	63	86	130	180	210	250	290	310
10	63	66	86	120	180	250	290	340	400	420
15	63	100	140	180	270	370	400	470	530	550
22	63	140	190	250	1380	520	560	650	730	760
33	63	200	260	340	520	710	760	890	000	1000
47	63	250	340	430	660	900	970	1100	1300	1300
68	63	320	440	560	840	1200	1300	1500	1600	1700
100	63	450	600	780	1200	1600	1700	2000	2300	2400
2.2	100	24	32	43	66	91	110	120	150	160
3.3	100	32	42	57	87	120	140	160	200	210
4.7	100	41	54	74	110	160	190	210	250	270
6.8	100	56	74	100	150	210	250	290	340	370
10	100	73	96	130	200	280	330	370	450	480
15	100	130	170	230	320	440	480	550	630	670
22	100	170	230	300	440	600	650	740	850	910
33	100	220	300	400	580	780	850	970	1100	1200
47	100	290	380	510	740	000	1100	1300	1400	1500
68	100	390	520	700	1000	1400	1500	1700	2000	2100
100	100	520	690	920	1300	1800	2000	2300	2600	2800

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) 1 kHz 20°C	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	0.095	6.9	10	1.8	EBT 20 FB 122 G
3.3	40	15	8.5 x 17	0.095	4.6	6.7	1.8	EBT 20 FB 133 G
4.7	40	15	8.5 x 17	0.095	3.2	4.7	1.8	EBT 20 FB 147 G
6.8	40	15	8.5 x 20	0.095	2.2	3.2	2.3	EBT 20 FC 168 G
10	40	15	10 x 20	0.095	1.5	2.2	3.1	EBT 20 GC 210 G
15	40	15	10 x 25	0.08	0.85	1.5	3.5	EBT 20 GD 215 G
22	40	15	12 x 25	0.08	0.58	1.0	4.5	EBT 20 HD 222 G
33	40	15	12 x 30	0.08	0.38	0.67	5.5	EBT 20 HE 233 G
47	40	15	14 x 30	0.08	0.27	0.47	8	EGT 20 JE 247 G
68	40	15	16 x 30	0.08	0.19	0.32	10	EGT 20 KE 268 G
100	40	15	16 x 40	0.08	0.13	0.22	13	EGT 20 KG 310 G
2.2	63	23	8.5 x 17	0.09	6.5	9.5	1.8	EBT 20 FB 122 J
3.3	63	23	8.5 x 20	0.09	4.3	6.4	2.3	EBT 20 FC 133 J
4.7	63	23	10 x 20	0.09	3.0	4.5	3.1	EBT 20 GC 147 J
6.8	63	23	10 x 25	0.09	2.1	3.1	3.5	EBT 20 GD 168 J
10	63	23	12 x 25	0.09	1.4	2.1	4.5	EBT 20 HD 210 J
15	63	23	12 x 30	0.07	0.74	1.4	5.5	EBT 20 HE 215 J
22	63	23	14 x 30	0.07	0.50	0.95	10	EGT 20 JE 222 J
33	63	23	16 x 40	0.07	0.34	0.64	13	EGT 20 KG 233 J
47	63	23	18 x 40	0.07	0.24	0.45	16	EGT 20 LG 247 J
68	63	23	21 x 40	0.07	0.16	0.31	20	EGT 20 MG 268 J
100	63	23	25 x 40	0.07	0.11	0.21	28	EGT 20 NG 310 J
2.2	100	35	8.5 x 20	0.085	6.1	9.1	2.3	EBT 20 FC 122 L
3.3	100	35	10 x 20	0.085	4.1	6.1	3.1	EBT 20 GC 133 L
4.7	100	35	10 x 25	0.085	2.9	4.3	3.5	EBT 20 GD 147 L
6.8	100	35	12 x 25	0.085	2.0	2.9	4.5	EBT 20 HD 168 L
10	100	35	12 x 30	0.085	1.35	2.0	5.5	EBT 20 HE 210 L
15	100	35	16 x 30	0.065	0.69	1.3	10	EGT 20 KE 215 L
22	100	35	16 x 40	0.065	0.47	0.91	13	EGT 20 KG 222 L
33	100	35	18 x 40	0.065	0.31	0.61	16	EGT 20 LG 233 L
47	100	35	21 x 40	0.065	0.22	0.43	20	EGT 20 MG 247 L
68	100	35	25 x 40	0.065	0.15	0.29	28	EGT 20 NG 268 L
100	100	35	25 x 45	0.065	0.1	0.20	33	EGT 20 NJ 310 L

* If the received capacitance is at the lower tolerance limit, the indicated values may increase by approx. 15%.

Ordering example:
EBT 15 / 63. dim. 12 x 30
EBT 20 HE 215 J

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