



## Aluminium Electrolytic Capacitors

### 4 High Capacity Capacitors Type GM



#### Features

- high CU product
- long useful life
- all contacts welded
- threaded terminals
- type GMA for clamp mounting
- type GMB for stud mounting

#### Applications

- standard and switched mode power supplies
- computer
- telecommunications
- general industrial
- audio HiFi systems

#### Quick reference

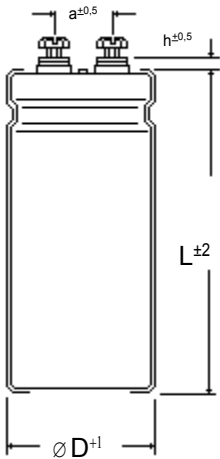
Temperature range	- 40°C ... + 85°C
Tolerance	± 20%
Max. reverse voltage	2V
Useful life	see diagram Useful life p. 28
Leakage current 5 min @ U <sub>R</sub>	0,008 * C [µF] * U [V] + 6µA [µA]
Leakage current 1 h @ U <sub>R</sub>	0,15 * leakage current 5 min @ U <sub>R</sub>
Specs.	DIN 41332 IEC 384 - 4
Insulation	shrink - on sleeve voltage proof ≥ 2500 V AC
Content of supply	GMA... connecting screws GMB... connecting screws + mounting nut
Terminals	up to 75 mm Ø M 5 , beyond M 6



### 4.1 Mechanical Data Type GM

#### GMA

clamp mounted

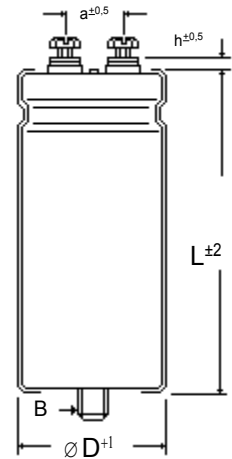


D [mm]	h [mm]	a [mm]	B	terminals
35	6	13	M 8 x 12	M 5
40	5	18	M 8 x 12	M 5
50	5	22	M 12 x 16	M 5
65	5	28,5	M 12 x 16	M 5
75	5	31,7	M 12 x 16	M 5 (M 6)
90	5	31,7	M 12 x 16	M 6

	thread	max. tightening torque
terminals	M 5	2,0 Nm
terminals	M 6	2,5 Nm
mounting	M 8	4,0 Nm
mounting	M 12	10,0 Nm

#### GMB

bolt mounted



Capacitance [µF]	Rated voltage [V]								
	40	63	80	100	160	250	350	400	500
220									35 x 70
330									35 x 70
470							35 x 54	35 x 70	40 x 70
680							35 x 70	40 x 70	50 x 70
1000					35 x 54	40 x 70	40 x 70	50 x 80	50 x 100
1500					35 x 70	50 x 70	50 x 80	50 x 100	65 x 100
2200				35 x 54	35 x 80	50 x 80	50 x 100	65 x 100	75 x 100
3300				35 x 54	40 x 100	65 x 80	65 x 100	75 x 100	75 x 145
4700			35 x 54	40 x 70	50 x 100	65 x 100	75 x 100	75 x 145	90 x 148
6800		35 x 54	35 x 70	40 x 70	65 x 100	75 x 100	75 x 145	90 x 148	
10000	35 x 54	35 x 70	40 x 70	50 x 80	75 x 100	75 x 145	90 x 148	90 x 170	
15000	35 x 70	40 x 70	50 x 80	50 x 100	75 x 145	90 x 148	90 x 170	90 x 230	
22000	40 x 70	50 x 80	65 x 100	65 x 100	90 x 148	90 x 230			
33000	50 x 70	50 x 100	75 x 100	75 x 100	90 x 170				
47000	50 x 80	65 x 100	75 x 145	75 x 145	90 x 230				
68000	65 x 80	75 x 100	90 x 148	90 x 148					
100000	75 x 100	75 x 145	90 x 170	90 x 170					
150000	75 x 145	90 x 148	90 x 230	90 x 230					
220000	90 x 148	90 x 170							
330000	90 x 170	90 x 230							
470000	90 x 230								



## Aluminium Electrolytic Capacitors

### 4.2 Standard Values Type GM

U <sub>R</sub> [V]	C <sub>R</sub> [μF]	Case size Ø x L [mm]	ESR <sub>100 Hz</sub>	ESR <sub>100 Hz</sub>	tan δ <sub>100 Hz</sub>	Z <sub>10 kHz</sub>	Rated ripple current 100 Hz 85 °C [A]	Order code GMA... GMB...
			20 °C typ. [mΩ]	20 °C max. [mΩ]	20 °C max. [%]	20 °C max. [mΩ]		
40	10000	35 x 54	30	42	28	30	4,2	...10304035054
40	15000	35 x 70	26	29	37	24	5,0	...15304035070
40	22000	40 x 70	18	23	37	19	6,4	...22304040070
40	33000	50 x 70	12	20	37	15	8,3	...33304050070
40	47000	50 x 80	10	16	44	12	9,6	...47304050080
40	68000	65 x 80	9	14	58	10	11,5	...68304065080
40	100000	75 x 100	6	12	57	8	15,2	...10404075100
40	150000	75 x 145	5	9	71	7	19,2	...15404075145
40	220000	90 x 148	4	8	83	6	24,0	...22404090148
40	330000	90 x 170	3	7	93	5	29,1	...33404090170
40	470000	90 x 230	3	7	133	5	33,3	...47404090230
63	6800	35 x 54	23	40	15	35	4,8	...68206335054
63	10000	35 x 70	15	34	14	23	6,6	...10306335070
63	15000	40 x 70	14	28	20	18	7,2	...15306340070
63	22000	50 x 80	13	23	27	15	8,4	...22306350080
63	33000	50 x 100	12	19	37	12	9,6	...33306350100
63	47000	65 x 100	8	16	35	10	13,2	...47306365100
63	68000	75 x 100	5	13	32	8	16,7	...68306375100
63	100000	75 x 145	5	11	47	7	19,2	...10406375145
63	150000	90 x 148	4	9	57	5	24,2	...15406390148
63	220000	90 x 170	4	8	83	4	25,2	...22406390170
63	330000	90 x 230	3	6	93	4	33,3	...33406390230
80	4700	35 x 54	33	48	15	28	4,0	...47208035054
80	6800	35 x 70	23	39	15	23	5,4	...68208035070
80	10000	40 x 70	15	31	14	18	7,0	...10308040070
80	15000	50 x 80	14	25	20	14	8,1	...15308050080
80	22000	65 x 100	13	20	27	12	10,4	...22308065100
80	33000	75 x 100	12	17	37	10	10,8	...33308075100
80	47000	75 x 145	8	14	35	8	15,2	...47308075145
80	68000	90 x 148	5	12	32	7	21,6	...68308090148
80	100000	90 x 170	4	10	38	6	25,2	...10408090170
80	150000	90 x 230	4	9	57	4	28,9	...15408090230
100	2200	35 x 54	55	60	11	35	3,1	...22210035054
100	3300	35 x 54	33	46	10	27	4,0	...33210035054
100	4700	40 x 70	23	36	10	22	5,6	...47210040070
100	6800	40 x 70	18	31	12	18	6,4	...68210040070
100	10000	50 x 80	15	26	14	14	7,8	...10310050080
100	15000	50 x 100	14	20	20	12	8,8	...15310050100
100	22000	65 x 100	10	16	21	10	11,8	...22310065100
100	33000	75 x 100	6	13	19	8	15,2	...33310075100
100	47000	75 x 145	5	11	22	7	19,2	...47310075145
100	68000	90 x 148	4	9	26	6	24,2	...68310090148
100	100000	90 x 170	4	8	38	5	25,2	...10410090170
100	150000	90 x 230	4	7	45	5	28,9	...15410090230



### Standard Values Type GM

U <sub>R</sub> [V]	C <sub>R</sub> [μF]	Case size Ø x L [mm]	ESR <sub>100 Hz</sub> 20°C typ. [mΩ]	ESR <sub>100Hz</sub> 20°C max. [mΩ]	tan δ <sub>100Hz</sub> 20°C max. [%]	Z <sub>10KHz</sub> 20°C max. [mΩ]	Rated ripple current 100Hz 85°C [A]	Order code GMA... GMB...
160	1000	35 x 54	63	81	6	40	2,9	...10216035054
160	1500	35 x 70	40	70	6	35	4,1	...15216035070
160	2200	35 x 80	58	60	12	27	3,6	...22216035080
160	3300	40 x 100	43	49	13	21	4,7	...33216040100
160	4700	50 x 100	28	38	12	17	6,3	...47216050100
160	6800	65 x 100	20	30	13	14	8,3	...68216065100
160	10000	75 x 100	16	24	15	11	9,3	...10316075100
160	15000	75 x 145	10	19	14	9	13,6	...15316075145
160	22000	90 x 148	8	15	17	8	17,1	...22316090148
160	33000	90 x 170	5	11	16	7	22,6	...33316090170
160	47000	90 x 230	5	10	22	6	25,8	...47316090230
250	1000	40 x 70	70	130	7	150	3,2	...10225040070
250	1500	50 x 70	60	90	8	130	3,7	...15225050070
250	2200	50 x 80	40	70	8	90	4,8	...22225050080
250	3300	65 x 80	32	42	10	60	6,1	...33225065080
250	4700	65 x 100	25	35	11	50	7,5	...47225065100
250	6800	75 x 100	15	24	10	40	9,6	...68225075100
250	10000	75 x 145	17	30	16	30	10,4	...10325075145
250	15000	90 x 148	12	20	17	28	14,0	...15325090148
250	22000	90 x 230	9	16	19	26	19,2	...22325090230
350	470	35 x 54	90	130	4	175	2,4	...47135035054
350	680	35 x 70	80	110	5	125	2,9	...68135035070
350	1000	40 x 70	60	80	6	110	3,5	...10235040070
350	1500	50 x 80	50	70	7	75	4,3	...15235050080
350	2200	50 x 100	35	40	7	45	5,6	...22235050100
350	3300	65 x 100	25	35	8	30	7,5	...33235065100
350	4700	75 x 100	20	30	9	21	8,3	...47235075100
350	6800	75 x 145	12	15	8	15	12,4	...68235075145
350	10000	90 x 148	10	13	9	13	15,3	...10335090148
350	15000	90 x 170	9	12	13	12	16,8	...15335090170
400	470	35 x 70	170	200	8	200	1,9	...47140035070
400	680	40 x 70	120	150	8	130	2,5	...68140040070
400	1000	50 x 80	60	90	6	85	3,9	...10240050080
400	1500	50 x 100	50	70	7	62	4,7	...15240050100
400	2200	65 x 100	35	50	7	55	6,3	...22240065100
400	3300	75 x 100	25	35	8	36	7,5	...33240075100
400	4700	75 x 145	20	30	9	25	9,6	...47240075145
400	6800	90 x 148	10	19	6	18	15,3	...68240090148
400	10000	90 x 170	9	18	8	15	16,8	...10340090170
400	15000	90 x 230	8	16	11	12	20,4	...15340090230

Please choose type GH ( p. 29 ) for a longer useful life.

Please choose type G ( p. 14 ) for higher ripple currents.



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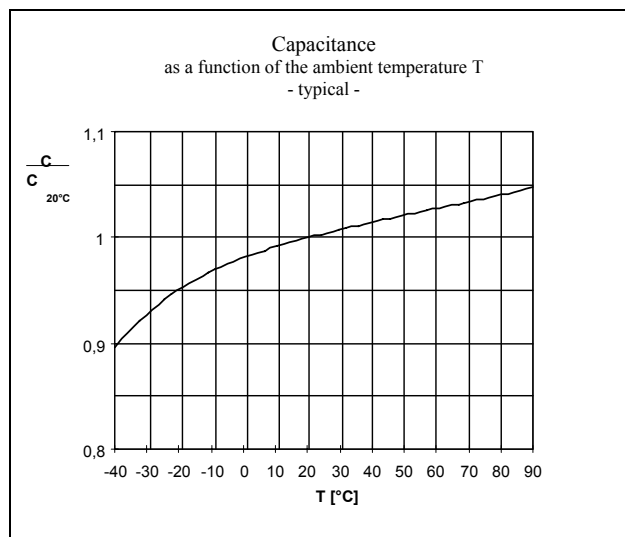
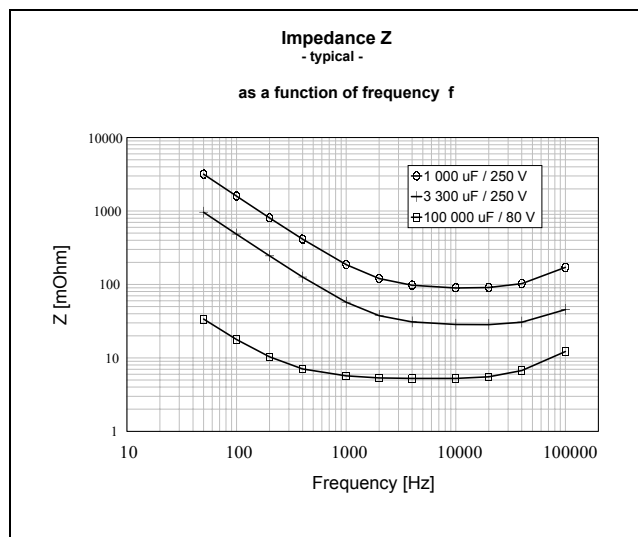
### Standard Values Type GM

$U_R$ [V]	$C_R$ [ $\mu$ F]	Case size $\varnothing \times L$ [mm]	ESR <sub>100 Hz</sub> 20°C typ. [m $\Omega$ ]	ESR <sub>100 Hz</sub> 20°C max. [m $\Omega$ ]	$\tan \delta$ <sub>100 Hz</sub> 20°C max. [%]	$Z$ <sub>10 kHz</sub> 20°C max. [m $\Omega$ ]	Rated ripple current 100 Hz 85°C [A]	Order code GMA... GMB...
500	220	35 x 70	240	360	5	600	1,7	...22150035070
500	330	35 x 70	220	330	7	520	1,7	...33150035070
500	470	40 x 70	170	255	8	400	2,1	...47150040070
500	680	50 x 70	112	168	7	330	2,7	...68150050070
500	1000	50 x 100	80	120	8	250	3,7	...10250050100
500	1500	65 x 100	65	97	9	120	4,6	...15250065100
500	2200	75 x 100	44	66	9	80	5,6	...22250075100
500	3300	75 x 145	34	51	11	70	7,4	...33250075145
500	4700	90 x 148	28	42	12	50	9,1	...47250090148

Please choose type GH ( p. 29 ) for a longer useful life.

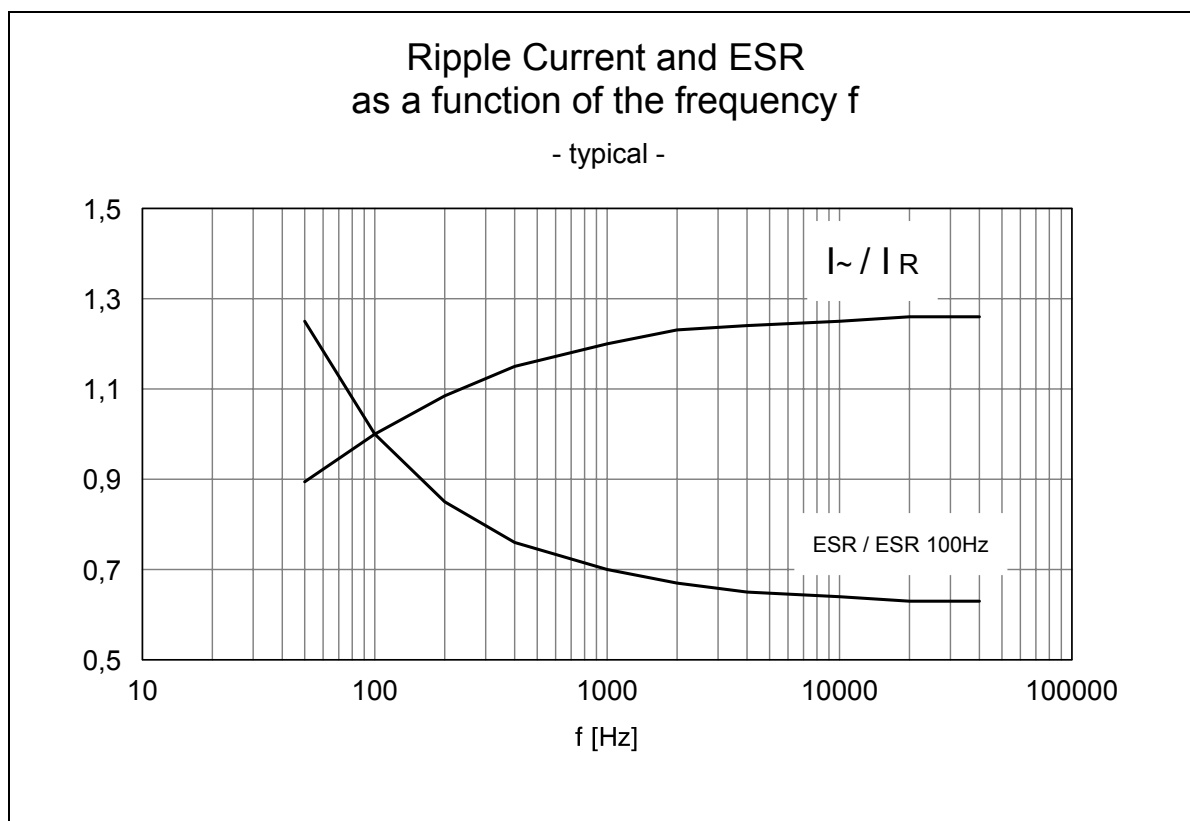
Please choose type G ( p. 14 ) for higher ripple current.

### 4.3 Technical Data Type GM



### ESL

diameter	≤50 mm	65 mm	75 mm	90 mm
ESL [nH]	≈ 10	≈ 15	≈ 20	≈ 20



Because the contact elements have a limited current loading, the following currents may not be exceeded.

diameter	≤ 50 mm	65 mm	75 mm	90 mm
max. ripple current	30 A	40 A	50 A	60 A



## Aluminium Electrolytic Capacitors

### 4.3.1 Useful Life Type GM

