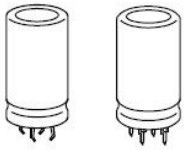
VDTCAP

FW series



Series	Capacitance range	Voltage range	Temperature range	Case D*H	Applications
FW	100-47000	40-450	-40℃ +105℃	30x40 40x100	Solder pin mounting Industrial applications

MECHANICAL OUT LINES:

CASE:cylindrical aluminium made
TERMINALS: to be soldered, for printed wiring board
SEALING:hermetic by beading on a Rubber Bakelite covers
PRESSURE RELEASE VENT:directly on to the aluminium case
SLEEVE:self-extinguishing thermoshrinkable sleeve
MOUNTING:vertical, by soldering to printed circuit board,
SIZE: see enclosed drawings

SPECIFICATIONS	TEMPERATURE RANGE	CAPACITANCE
CECC 30301-805 IEC 384-4 ("long life grade") DIN 40010 DIN 41240/DIN 41238	Operating: -40℃/ +105℃ Climatic Category(IEC 68): 40/85/56	Tolerance shall be within the following limits: -20%+20%(standard tolerance) or -10%+30%(available on request)

LEAKAGE CURRENT:

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be:

Maximum limit	at 25℃	$I_f \leq 0.004*C*V$
Operating limit	at 25℃	$I_f \leq 0.002*C*V$

Where I_f =leakage current (μA)
C =capacitance (μF)
V =rated voltage(V)

IMPORTANT

When using high-capacitance and high-voltage electrolytic capacitors it is important to remember that the inner part(the rolled
section) is not insulated from can: between the negative pole and the aluminium can there is a variable and not defined resistance
essentially due to the electrolyte used in capacitor manufacture.

SURGE VOLTAGE

Working Voltage	25	40	50	63	100	160	200	250	400	420	450
Surge Voltage	29	46	58	73	115	185	230	290	440	460	490

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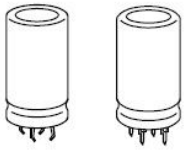


RIPPLE CURRENT:

The allowable values of ripple current in amperes, are related to the temperature and frequency by the formula:

$$I_r = K_t * K_f * I_r85$$

Where I_r85 is the limit given by tables, referred to a temperature of 85℃ and to a frequency of 100Hz and K_t or K_f are values here

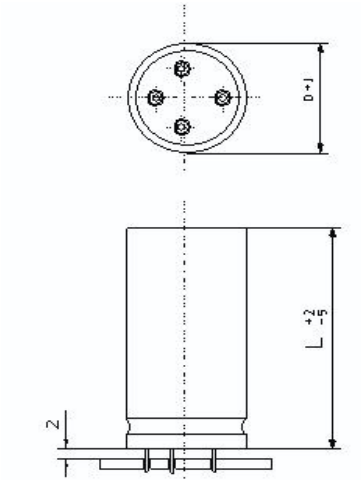
Below tabulated:

℃	40	50	65	75	85
K_t	2.3	1.9	1.7	1.4	1.0

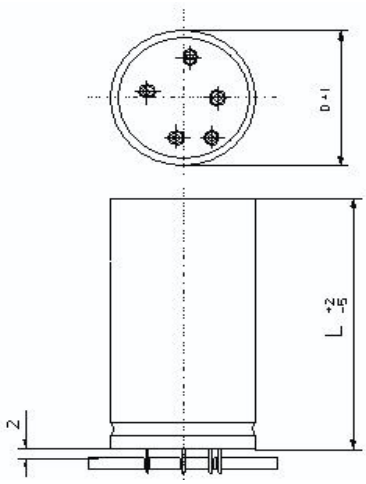
V_N	Hz	50	100	300	400	500	>1KHz
V≤50	K_f	0.90	1.00	1.14	1.18	1.20	1.25
50<V≤100		0.88	1.00	1.20	1.25	1.35	1.40
V>100		0.88	1.00	1.20	1.25	1.35	1.40

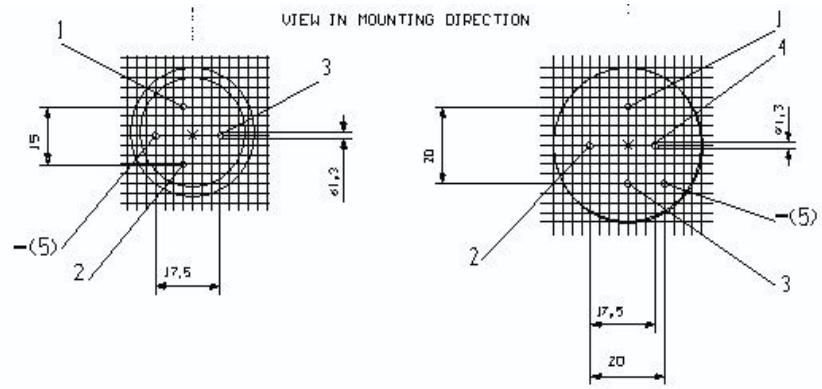
CAPACITORS DIMENSIONS AND DRILLING PLAN OF PRINTED WIRING BOARD

D=30 / 35 mm



D=40mm

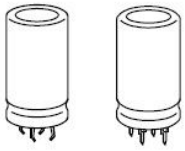




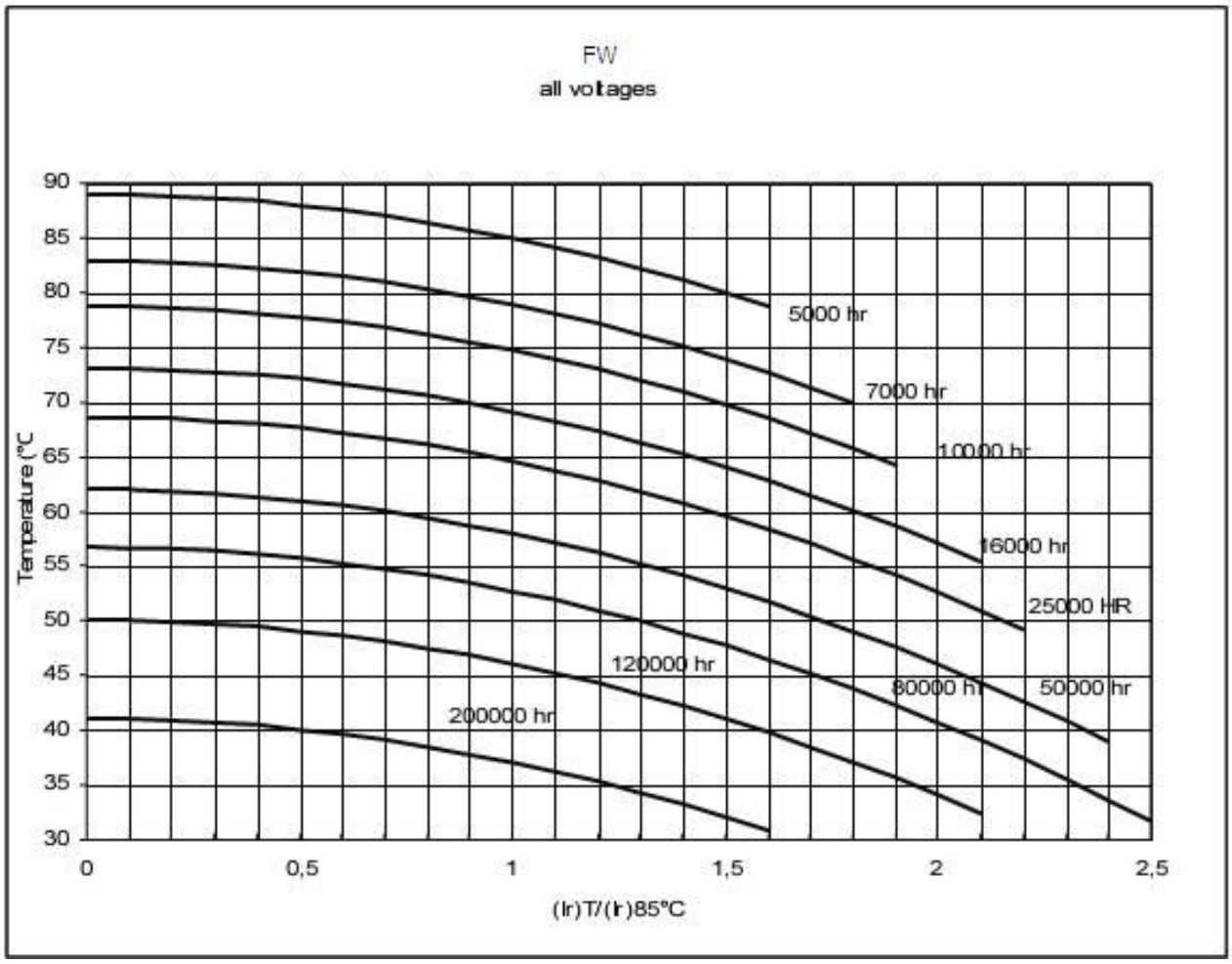
CASE	Φ X L	CASE	Φ X L	CASE	Φ X L	CASE	Φ X L
MB	30 x 40	NC	35 x 50	PB	40 x 40	PE	40 x 75
NB	35 x 40	NE	35 x 75	PC	40 x 50	PG	40 x 100

· Positive pole marked with 《 1 》

· The terminals marked with "2""3""4》 are to be considered only as mechanical connections and must be soldered to insulated pads.



Expected life as a function of temperature and ripple current



Expected life criteria:see introduction

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
6800	40	MB	30x40	0.18	32	24	30	11.1	5.9	FW682M040MB1
10000		NB	35x40	0.22	26	20	26	13.2	7.0	FW103M040NB1
15000		NC	35x50	0.34	27	20	26	14.1	7.4	FW153M040NC1
22000		PC	40x50	0.40	22	16	21	17.2	9.0	FW223M040PC1
33000		PE	40x75	0.46	17	12	16	22.4	11.8	FW333M040PE1
47000		PG	40x100	0.55	14	10	14	27.8	14.6	FW473M040PG1

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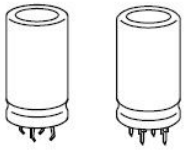

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
4700	63	MB	30x40	0.24	61	46	58	8.0	4.2	FW472M063MB1
6800		NB	35x40	0.24	42	32	40	10.5	5.5	FW682M063NB1
10000		PC	40x50	0.24	29	21	27	14.9	7.9	FW103M063PC1
15000		PE	40x75	0.29	23	17	22	18.9	10.0	FW153M063PE1
22000		PG	40x100	0.32	17	13	25	25.0	13.1	FW223M063PG1

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
1500	100	MB	30x40	0.09	72	54	58	7.4	3.9	FW152M100MB1
2200		NB	35x40	0.11	60	45	47	8.9	4.7	FW222M100NB1
3300		NC	35x50	0.11	40	30	31	11.9	6.3	FW332M100NC1
4700		PC	40x50	0.13	33	25	28	13.7	7.2	FW472M100PC1
6800		PE	40x75	0.13	23	17	19	18.9	10.0	FW682M100PE1
10000		PG	40x100	0.13	16	12	13	26.1	13.7	FW103M100PG1

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
330	200	MB	30x40	0.09	326	244	252	3.6	1.9	FW331M100MB1
470		NB	35x40	0.09	229	172	176	4.7	2.5	FW471M100NB1
680		NC	35x50	0.09	158	119	122	6.2	3.3	FW681M100NC1
1000		PC	40x50	0.09	107	81	82	8.1	4.3	FW102M100PC1
1500		PE	40x75	0.09	72	54	55	11.4	6.0	FW152M100PE1
2200		PG	40x100	0.09	49	37	38	15.7	8.3	FW222M100PG1

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
220	250	MB	30x40	0.09	489	366	406	3.0	1.6	FW221M250MB1
330		NB	35x40	0.09	326	244	270	4.0	2.1	FW331M250NB1
470		NC	35x50	0.09	229	172	190	5.2	2.7	FW471M250NC1
680		PC	40x50	0.09	158	119	131	6.7	3.5	FW681M250PC1
1000		PE	40x75	0.09	107	81	89	9.3	4.9	FW102M250PE1
1500		PG	40x100	0.09	72	54	59	13.0	6.8	FW152M250PG1

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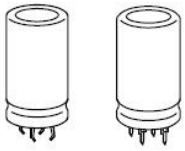

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
150	385	MB	30x40	0.09	717	537	587	2.5	1.3	FW151M385MB1
220		NB	35x40	0.09	489	366	405	3.2	1.7	FW221M385NB1
330		NC	35x50	0.09	326	244	207	4.3	2.3	FW331M385NC1
470		PB	40x40	0.09	229	172	190	5.6	2.8	FW471M400PB1
680		PC	40x50	0.09	158	119	130	8.6	4.5	FW471M385PC1
1000		NE	40x75	0.09	107	81	130	9.3	4.9	FW102M385NE1
1000		PE	40x75	0.09	107	81	89	10.6	5.6	FW681M385PE1
1000		PG	40x100	0.09	107	81	89	11.0	5.8	FW102M385PG1
1500		PG	40x100	0.09	72	54	66	12.4	6.5	FW152M385PG1

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
150	400	MB	30x40	0.09	717	537	587	2.5	1.3	FW151M400MB1
220		NB	35x40	0.09	489	366	405	3.2	1.7	FW221M400NB1
330		NC	35x50	0.09	326	244	270	4.3	2.3	FW331M400NC1
470		PB	40x40	0.09	229	172	190	5.6	2.8	FW471M400PB1
680		PC	40x50	0.09	158	119	130	8.6	4.5	FW681M400PC1
1000		NE	40x75	0.09	107	81	130	9.3	4.9	FW102M400NE1
1000		PE	40x75	0.09	107	81	89	10.6	5.6	FW102M400PE1
1000		PG	40x100	0.09	107	81	89	11.0	5.8	FW102M400PG1
1500		PG	40x100	0.09	72	54	66	12.4	6.5	FW122M400PG1

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
150	420	MB	30x40	0.09	717	537	587	2.5	1.3	FW151M420MB1
220		NB	35x40	0.09	489	366	405	3.2	1.7	FW221M420NB1
330		NC	35x50	0.09	326	244	270	4.3	2.3	FW331M420NC1
680		PC	40x50	0.09	158	119	118	7.4	3.9	FW681M400PC1
1000		NE	35x75	0.09	107	81	130	8.2	4.3	FW102M420NE1
1000		PE	40x75	0.09	107	81	130	8.9	4.7	FW102M420PE1
1000		PG	40x100	0.09	107	81	89	10.6	5.6	FW102M420PG1
1500		PG	40x100	0.09	72	54	66	12.4	6.5	FW122M420PG1

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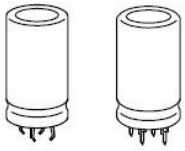

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55℃ 100Hz (A)	I ripple 85℃ 100Hz (A)	CATALOGUE NUMBER
100	450	MB	30x40	0.10	1194	896	869	1.9	1.0	FW101M450MB1
150		NB	35x40	0.10	796	597	579	2.6	1.3	FW151M450NB1
220		NC	35x50	0.10	543	407	394	3.4	1.8	FW221M450NC1
330		NC	35x50	0.10	362	271	263	4.1	2.2	FW331M450NC1
330		PC	40x50	0.10	362	271	263	4.5	2.3	FW331M450PC1
470		NC	35x50	0.10	254	191	185	4.9	2.6	FW471M450NC1
470		PC	40x50	0.10	254	191	185	5.3	2.8	FW471M450PC1
680		NE	35x75	0.10	176	132	139	6.5	3.4	FW681M450NE1
680		PE	40x75	0.10	176	132	127	7.3	3.8	FW681M450PE1
1000		PE	40x75	0.10	119	90	108	8.2	4.3	FW102M450PE1
1000		PG	40x100	0.10	119	90	94	9.7	5.1	FW102M450PG1
1500		PG	40x100	0.10	80	60	80	11.2	5.8	FW122M450PG1

Change the1 symbol with the needed capacitance tolerance code: 5=±5%, 1=±10%,2=±20%