

FXW2 · Screw-Terminal · 12000 h/85 °C

Higher Capacitance · Ultra compact · Long Life

Optional design for permanent and deep charge-discharge application with high voltage hub and pulsed operation mode upon request.

Spezielles Design für häufige und tiefe Lade-, Entladeanwendungen mit hohem Spannungshub und Impulsbetrieb auf Anfrage erhältlich.

> Specifications · Spezifikationen

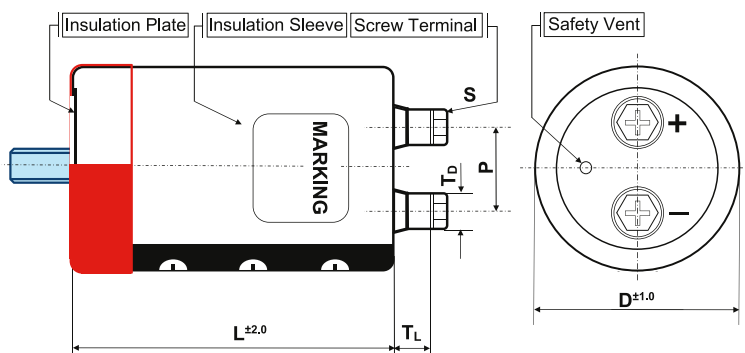
Items	Characteristics
Temperature range	-10°C ~ + 85°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage / Ripple voltage	Repetitive max. 30 sec per 6 Minutes / ≤ 50V
Leakage current max. I _L (20°C, 5 min)	0.01 · C · V, [μA] or 7 mA, which is smaller.
Useful life	12 000 hours at 85°C
Field failure rate	0.5 FIT = 0.5 · 10 ⁻⁹ Failures/hour
Reference standards	IEC 60384-4, JIS C 5101-4
Vibration	0.75mm, 10...55Hz, 10g, 3x2h
Outer materials	UL94-V0/UL224-VW1 certified (cap/sleeve)
Sleeve withstanding voltage	4000 Vac/1min between terminals bundled and plate*
Product Compliance	RoHS, REACH, Conflict Minerals a.o. – refer to p. 12–13

* Typical value



> Shape designation · Formbezeichnung

- additional information on p. 10–11 · Zusatzinformationen auf S. 10–11
- mounting accessories from p. 189 · Montagezubehör ab S. 189



Shape code Features	B Bolt	I/Y double sleeve for 2/3 points metal Bracket	N standard
outer insulation sleeve	•	•	•
insulation plate	•	•	•
stud bolt	•		
bottom double sleeve		•	

diameter code	ØD	available shape	P	S	T _L	T _D	Cap material
E	77	B, N, I, Y	31.5	M6x12	9.0	12	PH
				M5x10	8.0	11	PH
F	90	B, N, I, Y	31.5	M6x12	8.0	12	PH
				M5x10	7.0	11	PH

Size in mm. First listed terminal is standard.

> Product Code · Bestellbezeichnung

Example: Series FXW2 · 17000 µF +/- 20 % · 400 V · D = 77 mm · L = 188 mm with Bolt

FXW2 **2G** **173** **B** **E** **188**

Series name	Capacitance code		Shape code	Diameter code	Capacitance tolerance	Specific features (e.g. M6 ...)
Rated voltage code						
Code	Voltage	Code	Voltage			
2V	350	2W	450			
2G	400	2H	500			

∅ : ± 20 %
Q : -10 % ~ +30 %

Case length code – length in mm (3 digits)

Rated Voltage Code (Surge Voltage) V_r [V DC]	Capacitance C_r [µF]	Ripple Current at 85°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [mΩ]	Zmax at 20°C/10kHz [mΩ]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz $\tan \delta$	DxL [mm]	Product Code # = variable value, see fixing code in the product code
350 VDC Code: 2V Surge Voltage 400 VDC	15 000	14.0	35.0	23	24	20	0.70	77x148	FXW22V153#E148
	20 000	17.4	43.5	17	18	20	0.70	77x188	FXW22V203#E188
	21 000	17.7	44.3	17	18	20	0.70	90x150	FXW22V213#F150
	25 000	21.0	52.5	14	15	20	0.70	77x228	FXW22V253#E228
	28 000	21.8	54.5	13	14	20	0.70	90x190	FXW22V283#F190
	35 000	26.3	65.8	10	11	20	0.70	90x230	FXW22V353#F230
	42 000	31.0	77.5	8	9	20	0.70	90x268	FXW22V423#F268
400 VDC Code: 2G Surge Voltage 450 VDC	13 000	13.0	32.5	26	27	20	0.70	77x148	FXW22G133#E148
	17 000	16.0	40.0	20	21	20	0.70	77x188	FXW22G173#E188
	18 000	16.4	41.0	19	20	20	0.70	90x150	FXW22G183#F150
	21 000	19.3	48.3	17	18	20	0.70	77x228	FXW22G213#E228
	24 000	20.2	50.5	15	16	20	0.70	90x190	FXW22G243#F190
	30 000	24.3	60.8	12	13	20	0.70	90x230	FXW22G303#F230
	34 000	27.8	69.5	10	11	20	0.70	90x268	FXW22G343#F268
450 VDC Code: 2W Surge Voltage 500 VDC	10 000	9.1	22.8	40	42	20	0.70	77x148	FXW22W103#E148
	14 000	11.5	28.8	29	30	20	0.70	77x188	FXW22W143#E188
	15 000	11.9	29.8	27	29	20	0.70	90x150	FXW22W153#F150
	17 000	13.8	34.5	24	25	20	0.70	77x228	FXW22W173#E228
	20 000	14.7	36.8	20	21	20	0.70	90x190	FXW22W203#F190
	25 000	17.8	44.5	16	17	20	0.70	90x230	FXW22W253#F230
	30 000	20.8	52.0	13	14	20	0.70	90x268	FXW22W303#F268
500 VDC Code: 2H Surge Voltage 550 VDC	7 900	8.6	21.5	45	46	20	0.70	77x148	FXW22H792#E148
	10 000	10.4	26.0	36	38	20	0.70	77x188	FXW22H103#E188
	11 000	10.8	27.0	33	34	20	0.70	90x150	FXW22H113#F150
	13 000	12.8	32.0	28	29	20	0.70	77x228	FXW22H133#E228
	14 000	13.1	32.8	26	27	20	0.70	90x190	FXW22H143#F190
	18 000	16.0	40.0	20	21	20	0.70	90x230	FXW22H183#F230
	22 000	18.9	47.3	16	17	20	0.70	90x268	FXW22H223#F268

Additional designs on request · Weitere Designs auf Anfrage

> Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60		120		300		1k		≥ 10k		
Multiplier	0.70		1.00		1.18		1.34		1.45		
Temperature (°C)	40	45	50	55	60	65	70	75	80	85	
Multiplier	2.5	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.2	1.0	
Forced cooling – Wind speed [m/sec]	v < 0.25		v ≥ 0.25		v ≥ 0.5		v ≥ 1.0		v ≥ 2.0		v ≥ 3.0
Multiplier	1.00		1.05		1.10		1.15		1.20		1.25

> Life Time Table · Brauchbarkeitsdauer – Tabelle

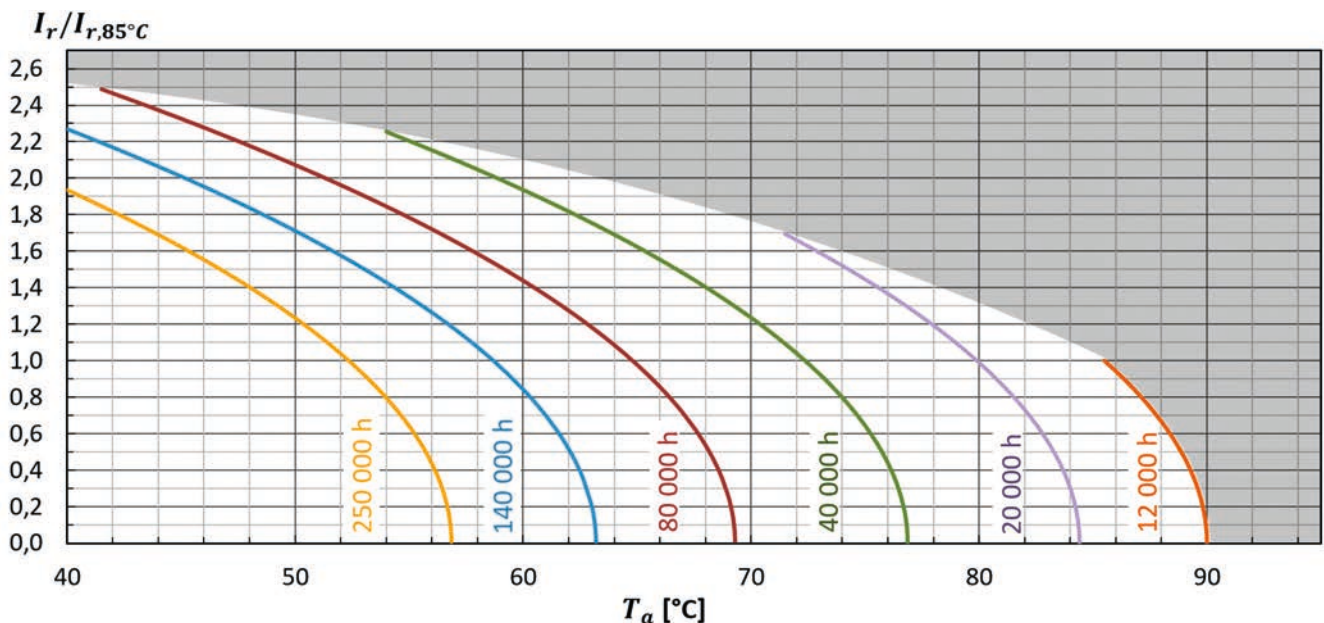
FXW2	Useful life as function of ambient temperature and ripple current											
I _r at 85°C	x 1.0	x 1.2	x 1.4	x 1.6	x 1.8	x 1.9	x 2.0	x 2.1	x 2.2	x 2.3	x 2.4	x 2.5
T _a = 40°C	250	250	250	250	250	250	225	190	159	132	108	89
T _a = 45°C	250	250	250	250	194	167	142	120	100	83	68	
T _a = 50°C	250	250	208	163	123	105	90	76	63	52		
T _a = 55°C	196	163	132	103	77	66	56	48	40			
T _a = 60°C	124	103	83	65	49	42	36					
T _a = 65°C	78	65	52	41	31							
T _a = 70°C	49	41	33	26								
T _a = 75°C	31	26	21									
T _a = 80°C	19	16										
T _a = 85°C	12											

khrs Max. value limited to 250 000 hours.

> Life Time Graph · Brauchbarkeitsdauer – Diagramm

Useful life depending on ambient temperature T_a and ripple current operating conditions I_r versus rated ripple current at the upper category temperature I_{r,85°C,120Hz}

Brauchbarkeitsdauer in Abhängigkeit von Umgebungstemperatur T_a und Wechselstrombelastung I_r im Verhältnis zur max. Wechselstrombelastung bei oberer Kategorie-temperatur I_{r,85°C,120Hz}



> Life Time Tests and Requirements · Anforderungen Brauchbarkeitsdauer

Life time test	Test procedure	Life time criteria
Endurance test	$T_a = 85^\circ\text{C}$; V_r , I_r applied 8000 hours	$\Delta C/C \leq 10\%$ (of initial value) $\text{Tan}\delta \leq 175\%$ (of specified value) $I_L \leq$ specified value
Useful life	$T_a = 85^\circ\text{C}$; V_r , I_r applied 12000 hours	$\Delta C/C \leq 15\%$ (of initial value) $\text{Tan}\delta < 200\%$ (of specified value) $I_L \leq$ specified value

Reference Specification: JIS C 5101-4, JIS C 5102, IEC 60384-4