

FXW · Screw-Terminal · 12000 h/85 °C

High 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

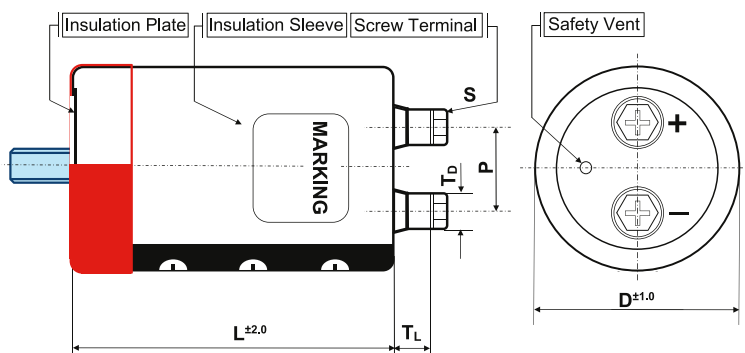
Items	Characteristics
Temperature range	-10°C ~ + 85°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage / Ripple voltage	Repetitive max. 30 sec per 6 Minutes / ≤ 50V
Leakage current max. I _L (20°C, 5 min)	0.01 • C • V, [μA] or 7 mA, which is smaller.
Useful life	12 000 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/X double sleeve for 2/3/4 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	M5x10	5.0	10	PH
				M6x12	4.5	17.2	PH
F	90	B, N, I, Y	31.5	M5x10	5.0	10	PH
				M6x12	5.0	17.2	PH
G	101	B, N, Y	31.5	M6x12	3.0	14	PPS

Size in mm. First listed terminal is standard.

> Product Code · Bestellbezeichnung

Example: Series FXW · 20000 µF +/- 20 % · 450 V · D = 101 mm · L = 195 mm with Bolt

FXW	2W	203	B	G	195
Series name	Capacitance code	Shape code	Diameter code	Capacitance tolerance	Specific features (e.g. M6 ...)
Rated voltage code					
Code	Voltage	Code	Voltage	Code	Voltage
2V	350	2G	400	2W	450
				∅ : ± 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]	Z _{max} at 20°C/10kHz [mΩ]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
350 VDC Code: 2V Surge Voltage 400 VDC	13 000	12.8	32.0	25	26	22	0.70	77x155	FXW2V133#E155PH
	17 000	16.1	40.3	19	20	22	0.70	77x195	FXW2V173#E195PH
		15.6	39.0	19	20	22	0.70	90x157	FXW2V173#F157PH
	22 000	19.8	49.5	17	18	22	0.70	77x235	FXW2V223#E235PH
	24 000	20.3	50.8	16	18	22	0.70	90x196	FXW2V243#F196PH
	26 000	23.4	58.5	15	16	22	0.70	77x283	FXW2V263#E283PH
	30 000	24.5	61.3	12	13	22	0.70	90x236	FXW2V303#F236PH
		23.5	58.8	12	13	32	0.70	101x195	FXW2V303#G195PH
	37 000	29.4	73.5	10	12	22	0.70	90x283	FXW2V373#F283PH
38 000	28.6	71.5	10	12	32	0.70	101x237	FXW2V383#G237PH	
45 000	33.6	84.0	8	10	32	0.70	101x283	FXW2V453#G283PH	
400 VDC Code: 2G Surge Voltage 450 VDC	11 000	11.8	29.5	31	32	22	0.70	77x155	FXW2G113#E155PH
	13 000	14.1	35.3	26	27	22	0.70	77x195	FXW2G133#E195PH
	15 000	14.7	36.8	23	24	22	0.70	90x157	FXW2G153#F157PH
	16 000	16.9	42.3	21	22	22	0.70	77x235	FXW2G163#E235PH
	19 000	18.1	45.3	21	22	22	0.70	90x196	FXW2G193#F196PH
	22 000	21.5	53.8	18	19	22	0.70	77x283	FXW2G223#E283PH
	24 000	21.9	54.8	17	18	22	0.70	90x236	FXW2G243#F236PH
		21.0	52.5	17	18	32	0.70	101x195	FXW2G243#G195PH
	30 000	26.5	66.3	13	14	22	0.70	90x283	FXW2G303#F283PH
25.4		63.5	13	14	32	0.70	101x237	FXW2G303#G237PH	
38 000	30.8	77.0	10	11	32	0.70	101x283	FXW2G383#G283PH	
450 VDC Code: 2W Surge Voltage 500 VDC	9 000	10.6	26.5	38	39	22	0.70	77x155	FXW2W902#E155PH
	11 000	12.9	32.3	31	32	22	0.70	77x195	FXW2W113#E195PH
	12 000	13.1	32.8	28	29	22	0.70	90x157	FXW2W123#F157PH
	14 000	15.8	39.5	25	27	22	0.70	77x235	FXW2W143#E235PH
	16 000	16.6	41.5	23	25	22	0.70	90x196	FXW2W163#F196PH
	19 000	20.0	50.0	20	21	22	0.70	77x283	FXW2W193#E283PH
	20 000	20.0	50.0	19	20	22	0.70	90x236	FXW2W203#F236PH
		19.2	48.0	19	20	32	0.70	101x195	FXW2W203#G195PH
	25 000	23.2	58.0	17	18	32	0.70	101x237	FXW2W253#G237PH
27 000	25.1	62.8	16	17	22	0.70	90x283	FXW2W273#F283PH	
34 000	29.2	73.0	13	14	32	0.70	101x283	FXW2W343#G283PH	

Additional designs on request · Weitere Designs auf Anfrage

FXW · Screw-Terminal · 12000 h/85 °C

> 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

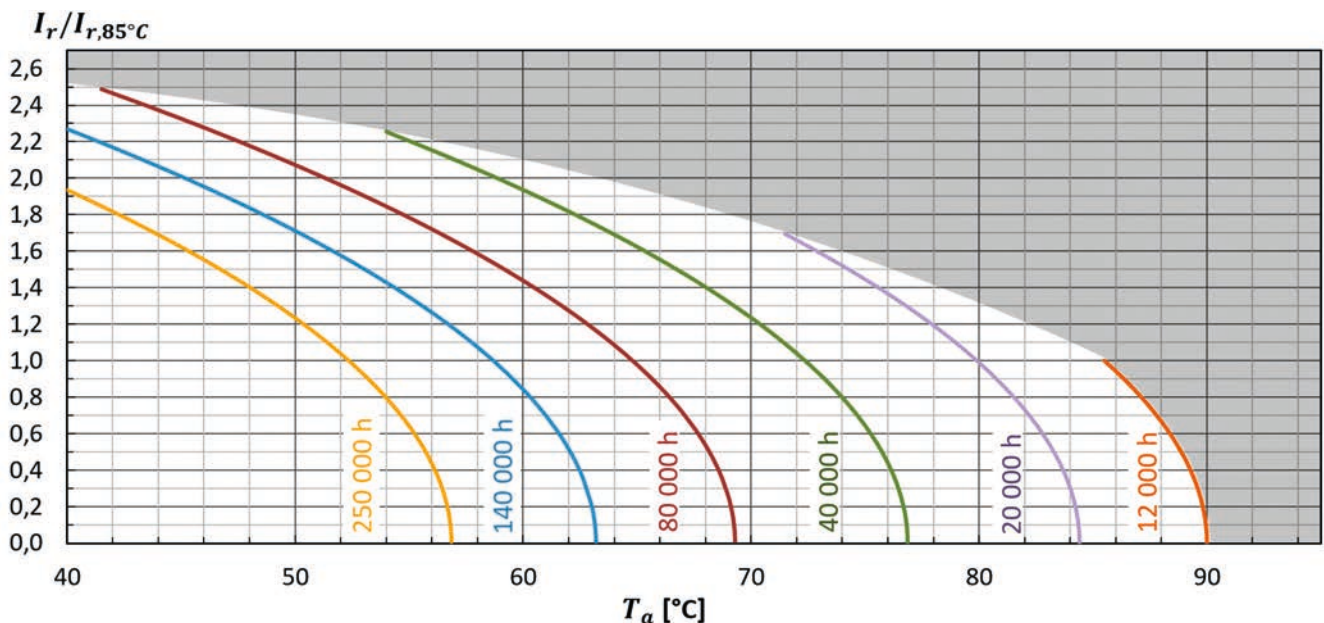
FXW	Useful life as function of ambient temperature and ripple current											
I_r at 85°C	x 1.0	x 1.2	x 1.4	x 1.6	x 1.8	x 1.9	x 2.0	x 2.1	x 2.2	x 2.3	x 2.4	x 2.5
$T_a = 40°C$	250	250	250	250	250	250	225	190	159	132	108	89
$T_a = 45°C$	250	250	250	250	194	167	142	120	100	83	68	
$T_a = 50°C$	250	250	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