

FXR · Screw-Terminal · 12 000 h/85 °C

High ripple · Long Life · Bottom cooling design

> Specifications · Spezifikationen

Items	Characteristics
Temperature range	-40°C ~ + 85°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage	Repetitive max. 30 sec per 6 Minutes
Leakage current max. I _L (20°C, 5 min)	0.01 • C • V _r [μA] or 3 mA, which is smaller.
Useful life	12 000 hours at 85°C
Field failure rate	0.5 FIT = 0.5 • 10 ⁻⁹ Failures/hour
RoHS conform	Directive 2011/65/EU & (EU)2015/863
Specification / Vibration	JIS C 5101-4 / 0.75mm, 10...55Hz, 10g, 3x2h



> Outline Drawings · Bauformen

Shape: B (ØD = 64-90)
(for Bolt - Mounting, M12x16, stud bolt is not isolated)

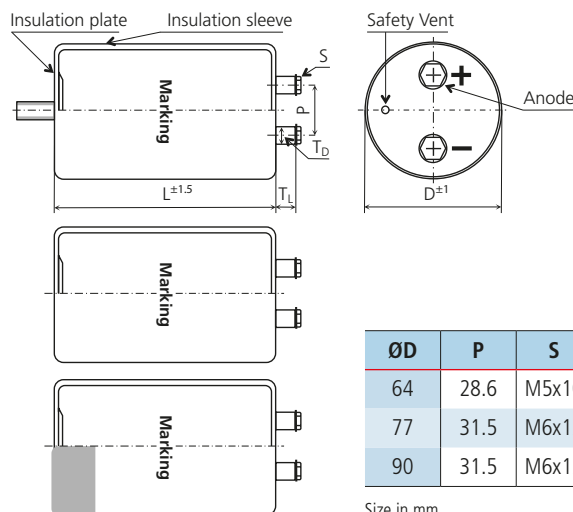
Form: B (ØD = 64-90)
(für Bolzenbefestigung, M12x16, Bolzen ist nicht isoliert)

Shape: N (for PBT-Holder ØD = 77-90 and Press Ring ØD = 64-90)

Form: N (für PBT-Halter ØD = 77-90 und Einpressring ØD = 64-90)

Shape: Y (ØD = 64-90)
(double sleeve, Y-bracket free of charge)

Form: Y (ØD = 64-90)
(mit doppelter Isolierung, Y-Schelle wird kostenlos mitgeliefert)



ØD	P	S	T _L	T _D	Cap material
64	28.6	M5x10	4.5	10	PPS
77	31.5	M6x12	3.0	16	PPS
90	31.5	M6x12	3.0	16	PPS

Size in mm.

> Product Code · Bestellbezeichnung

Example: Series FXR · 3900 μF +/- 20 % · 500 V · D=77 mm · L=161 mm with Y-Bracket

FRX		2H		392		Y		E		161 ()																							
Type of series		Capacitance code		Rated voltage code		Fixing symbol code		Case code diameter		Customers' specification																							
		The first two digits are significant. The last digit indicates the number of following zeros in μF				B : Bolt ØD = 64 - 90		<table border="1"> <thead> <tr> <th>ØD</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>64</td> <td>D</td> </tr> <tr> <td>77</td> <td>E</td> </tr> <tr> <td>90</td> <td>F</td> </tr> </tbody> </table>		ØD	Code	64	D	77	E	90	F																
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						N : No double sleeve (PBT-Safety-holder or press ring)																											
						Y : 3 Stoppers Bracket ØD = 64 - 90																											
										Case Code length Length in mm (3 digits)																							

Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 85°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	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	3 900	16.8	33.6	23	25	18	0.2	64x115	FXR2V392#D115
	4 700	19.4	38.8	18	20	18	0.2	64x131	FXR2V472#D131
	5 600	22.8	45.6	15	16	18	0.2	64x155	FXR2V562#D155
		24.8	49.6	15	16	19	0.2	77x121	FXR2V562#E121
		25.6	51.2	15	16	19	0.2	90x106	FXR2V562#F106
	6 800	28.8	57.6	12	13	19	0.2	77x137	FXR2V682#E137
		30.1	60.2	12	13	19	0.2	90x121	FXR2V682#F121
	8 200	33.7	67.4	10	10	19	0.2	77x161	FXR2V822#E161
		34.6	69.2	10	10	19	0.2	90x137	FXR2V822#F137
	10 000	41.1	82.2	8	9	19	0.2	90x161	FXR2V103#F161
12 000	45.0	90.0	7	7	19	0.2	90x161	FXR2V123#F161	
14 000	50.5	101.0*	7	7	19	0.2	90x178	FXR2V143#F178	
400 VDC Code: 2G Surge Voltage 450 VDC	2 700	13.2	26.4	34	36	18	0.2	64x100	FXR2G272#D100
	3 300	16.3	32.6	27	29	18	0.2	64x131	FXR2G332#D131
	3 900	19.0	38.0	23	25	18	0.2	64x155	FXR2G392#D155
		20.7	41.4	23	25	19	0.2	77x121	FXR2G392#E121
	4 700	20.8	41.6	18	20	18	0.2	64x155	FXR2G472#D155
		23.6	47.2	18	20	19	0.2	90x106	FXR2G472#F106
		23.9	47.8	18	20	19	0.2	77x137	FXR2G472#E137
	5 600	26.1	52.2	16	17	19	0.2	77x137	FXR2G562#E137
		27.4	54.8	16	17	19	0.2	90x121	FXR2G562#F121
	6 800	30.6	61.2	13	14	19	0.2	77x161	FXR2G682#E161
31.5		63.0	13	14	19	0.2	90x137	FXR2G682#F137	
8 200	37.0	74.0	10	10	19	0.2	90x161	FXR2G822#F161	
10 000	41.1	82.2	9	9	19	0.2	90x161	FXR2G103#F161	
450 VDC Code: 2W Surge Voltage 500 VDC	2 200	12.0	24.0	42	45	18	0.2	64x100	FXR2W222#D100
		14.4	28.8	46	48	19	0.2	77x96	FXR2W222#E096
	2 700	14.7	29.4	35	37	18	0.2	64x131	FXR2W272#D131
		17.5	35.0	28	30	18	0.2	64x155	FXR2W332#D155
	3 300	17.7	35.4	28	30	19	0.2	77x121	FXR2W332#E121
		19.0	38.0	25	27	18	0.2	64x155	FXR2W392#D155
		20.7	41.4	25	27	19	0.2	77x121	FXR2W392#E121
	4 700	21.4	42.8	25	27	19	0.2	90x106	FXR2W392#F106
		23.9	47.8	18	20	19	0.2	77x137	FXR2W472#E137
		25.1	50.2	18	20	19	0.2	90x121	FXR2W472#F121
5 600	27.8	55.6	16	18	19	0.2	77x161	FXR2W562#E161	
	28.6	57.2	16	18	19	0.2	90x137	FXR2W562#F137	
6 800	33.8	67.6	13	14	19	0.2	90x161	FXR2W682#F161	
8 200	37.0	74.0	10	10	19	0.2	90x161	FXR2W822#F161	
10 000	42.4	84.8	9	9	19	0.2	90x178	FXR2W103#F178	
500 VDC Code: 2H Surge Voltage 550 VDC	1 500	9.9	19.8	74	78	18	0.2	64x115	FXR2H152#D115
	1 800	11.5	23.0	62	65	18	0.2	64x131	FXR2H182#D131
	2 200	13.5	27.0	51	54	18	0.2	64x155	FXR2H222#D155
	2 700	17.2	34.4	39	41	19	0.2	77x121	FXR2H272#E121
	3 000	16.4	32.8	35	37	18	0.2	64x155	FXR2H302#D155R

Additional designs on request · Weitere Designs auf Anfrage

FXR · Screw-Terminal · 12 000 h/85 °C

Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 85°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
500 VDC Code: 2H Surge Voltage 550 VDC	3 300	16.9	33.8	32	34	19	0.2	90x106	FXR2H332#F106
		21.3	42.6	32	34	19	0.2	77x161	FXR2H332#E161
	3 900	21.8	43.6	25	28	19	0.2	90x121	FXR2H392#F121
		23.2	46.4	25	28	19	0.2	77x161	FXR2H392#E161
	4 200	23.6	47.2	24	27	19	0.2	77x178	FXR2H422#E178
	4 700	25.1	50.2	22	25	19	0.2	90x137	FXR2H472#F137
	5 600	29.1	58.2	18	20	19	0.2	90x161	FXR2H562#F161
	6 800	33.4	66.8	15	17	19	0.2	90x178	FXR2H682#F178
	7 000	32.5	65.0	15	17	19	0.2	90x161	FXR2H702#F161

* Please contact us if load condition exceeds 100A.

> Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	$\geq 10k$	Forced cooling [m/sec]	$v < 0.5$	$v \geq 0.5$	$v \geq 1.0$	$v \geq 3.0$
Multiplier	0.80	1.00	1.18	1.34	1.45	Multiplier	1.0	1.1	1.2	1.3

Temperature (°C)	40	45	50	55	60	65	70	75	80	85
Multiplier	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2	1.0

> Life Time Table · Brauchbarkeitsdauer – Tabelle

FXR	Useful life as function of ambient temperature and ripple current											
	I_r at 85°C	x 1.0	x 1.1	x 1.2	x 1.3	x 1.4	x 1.5	x 1.6	x 1.7	x 1.8	x 1.9	x 2.0
$T_a = 40^\circ\text{C}$	250	250	250	250	250	250	211	159	118	86	62	
$T_a = 45^\circ\text{C}$	250	250	250	250	222	174	133	101	75	54	39	
$T_a = 50^\circ\text{C}$	250	250	218	176	140	110	84	63	47	34		
$T_a = 55^\circ\text{C}$	200	168	138	111	89	69	53	40	30			
$T_a = 60^\circ\text{C}$	127	106	87	70	56	44	33	25				
$T_a = 65^\circ\text{C}$	80	67	55	44	35	27	21					
$T_a = 70^\circ\text{C}$	50	42	34	28	22	17						
$T_a = 75^\circ\text{C}$	32	26	22	17								
$T_a = 80^\circ\text{C}$	20	17	13									
$T_a = 85^\circ\text{C}$	12											

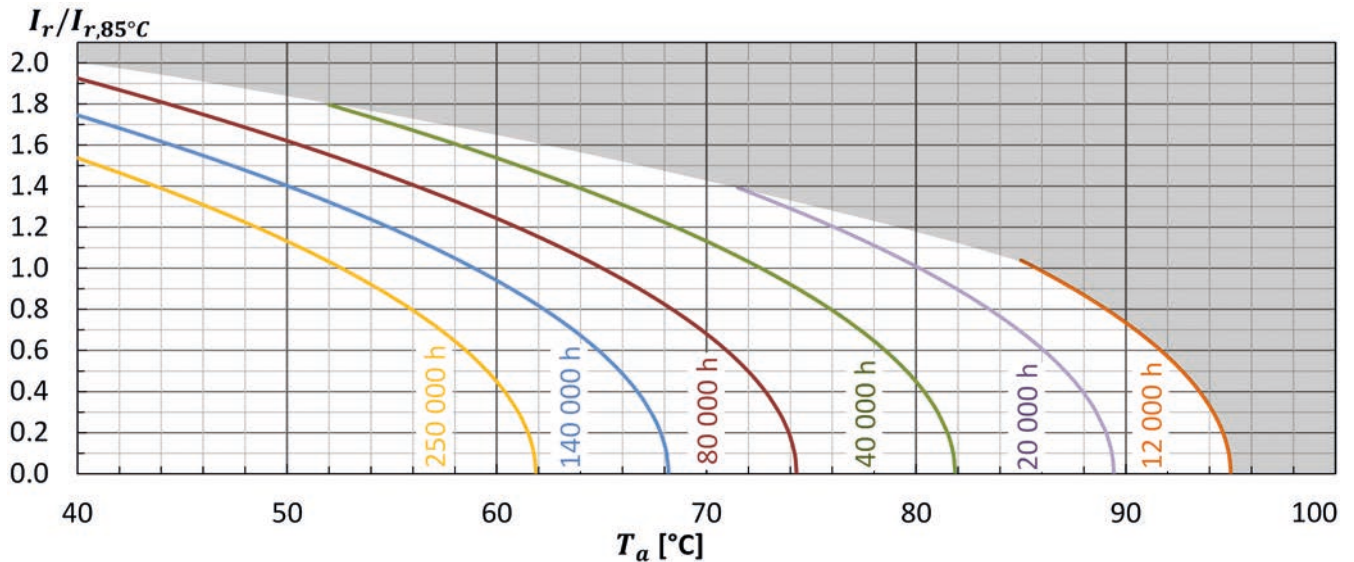
hrs Max. value limited to 250 000 hours.

Additional designs on request · Weitere Designs auf Anfrage

> 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 $I_{r, 85^\circ\text{C}, 120\text{Hz}}$

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



> 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	$\Delta C/C \leq 15\%$ (of initial value) $T_{\text{and}} \leq 175\%$ (of specified value) $I_L \leq$ specified value
Useful life	$T_a = 85^\circ\text{C}$; V_r , I_r applied 12000 hours	$\Delta C/C \leq 20\%$ (of initial value) $T_{\text{and}} < 200\%$ (of specified value) $I_L \leq$ specified value

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