

Special charge-discharge proof design available upon request.

Auf Anfrage spezielles Design für Lade-, Entladeanwendungen erhältlich.

► Specifications / Spezifikationen

Items	Characteristics
Temperature range	-25°C ~ + 85°C
Capacitance tolerance	+/- 20%
Surge voltage	Repetitive max. 30 sec per 6 Minutes
Leakage current max. I_L (20°C, 5 min)	$0.01 \cdot C \cdot V_r$ [μA] or 3 mA, which is smaller.
Useful life	6000 h at 85°C
Field failure rate	0.5 FIT = $0.5 \cdot 10^{-9}$ Failures/hour
RoHS conform	Directive 2002/95/ECff Annex
Specification / Vibration	JIS C 5101-4 / 0.75mm, 10...55Hz, 10g, 3x2h



► Outline Drawings / Bauformen

Shape: B (ØD = 51-101)
(for Bolt - Mounting, M12x16, stud bolt is not isolated)

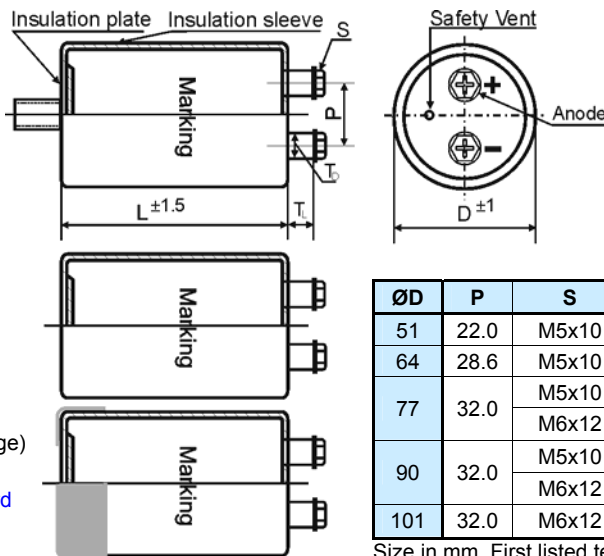
Form: B (ØD = 51-101)
(für Bolzenbefestigung, M12x16, Bolzen ist nicht isoliert)

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 = 51-101)
(double sleeve, bracket free of charge)

Form: Y (ØD = 51-101)
(mit doppelter Isolierung, Schelle wird kostenlos mitgeliefert)



ØD	P	S	T _L	T _D	Cap material
51	22.0	M5x10	4.5	10	PPS
64	28.6	M5x10	4.5	10	PPS
77	32.0	M5x10	4.5	10	PPS
		M6x12	5.0	16	PPS
90	32.0	M5x10	4.0	10	PPS
		M6x12	4.0	16	PPS
101	32.0	M6x12	3.0	14	PPS

Size in mm. First listed terminal is standard.

► Ripple Current Multiplier / Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	≥ 10k
multiplier	0.80	1.00	1.18	1.34	1.45

Forced cooling [m/sec]	v < 1.0	v ≥ 1.0
multiplier	1.0	1.1

► Product Code / Bestellbezeichnung

Example: 12000µF 500V D=101mm L=237mm with Y-Bracket

HCGF6 **2H** **123** **Y** **G** **237** **()**

Type of series

Capacitance code

The first two digits are significant. The last digit indicates the number of following zeros in µF.

Fixing symbol code

B : Bolt
ØD = 51 - 90

N : No double sleeve (PBT-Safety-holder or press ring)

Y : 3 Stoppers Bracket
ØD = 51 - 101

refer to pages 113 - 119

Case code diameter

ØD	Code
51	C
64	D
77	E
90	F
101	G

Customers' specification

Rated voltage code

Code	Voltage	Code	Voltage
2V	350	2W	450
2G	400	2H	500

Case Code length

Length in mm (3 digits)

HCGF6 Series

Screw-Terminal

6 000 h / 85°C

Rated Voltage Code (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 40°C/120Hz [A RMS]	Ripple Current at 85°C/120Hz I_r [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	ESL (typ) [nH]	DxL [mm]	Product Code
350 2V (400)	2 700	20.8	7.7	48	50	17	51x115	HCGF62V272□C115
	3 300	24.3	9.0	39	40	17	51x130	HCGF62V332□C130
	3 900	25.6	9.5	33	35	18	64x96	HCGF62V392□D096
	4 700	30.5	11.3	27	30	18	64x115	HCGF62V472□D115
	5 600	34.6	12.8	25	28	18	64x130	HCGF62V562□D130
	6 800	38.6	14.3	21	24	20	77x115	HCGF62V682□E115
	8 200	44.1	16.3	17	21	20	77x130	HCGF62V822□E130
	10 000	52.4	19.4	14	17	20	77x155	HCGF62V103□E155
	12 000	57.5	21.3	12	15	20	90x131	HCGF62V123□F131
		59.6	22.1	12	15	20	77x171	HCGF62V123□E171
	15 000	68.8	25.5	10	13	20	90x157	HCGF62V153□F157
	18 000	82.0	30.4	9	15	20	90x196	HCGF62V183□F196
	20 000	86.4	32.0	8	11	20	90x196	HCGF62V203□F196
	22 000	88.8	32.9	8	11	29	101x175	HCGF62V223□G175
		97.8	36.2	8	13	20	90x236	HCGF62V223□F236
98.0		36.3	8	10	20	90x221	HCGF62V223□F221	
27 000	110.4	40.9	7	8	29	101x237 ^{*)}	HCGF62V273□G237	
400 2G (450)	2 200	17.8	6.6	58	60	17	51x100	HCGF62G222□C100
		18.9	7.0	58	60	17	51x115	HCGF62G222□C115
	2 700	21.4	7.9	48	50	18	64x96	HCGF62G272□D096
		22.0	8.2	48	50	17	51x130	HCGF62G272□C130
	3 300	23.6	8.7	39	40	18	64x96	HCGF62G332□D096
	3 900	27.5	10.2	33	35	18	64x115	HCGF62G392□D115
	4 700	31.7	11.7	27	30	18	64x130	HCGF62G472□D130
	5 600	35.1	13.0	25	28	20	77x115	HCGF62G562□E115
	6 800	40.4	15.0	21	24	20	77x130	HCGF62G682□E130
	8 200	47.5	17.6	17	20	20	77x155	HCGF62G822□E155
	10 000	52.5	19.4	14	17	20	90x131	HCGF62G103□F131
		55.1	20.4	17	20	20	77x171	HCGF62G103□E171
		57.8	21.4	17	20	20	77x195	HCGF62G103□E195
	12 000	61.8	22.9	12	15	20	90x157	HCGF62G123□F157
	15 000	75.3	27.9	10	13	20	90x196	HCGF62G153□F196
	18 000	80.1	29.7	9	12	29	101x175	HCGF62G183□G175
		86.9	32.2	9	12	20	90x221	HCGF62G183□F221
		89.1	33.0	9	12	20	90x236	HCGF62G183□F236
	20 000	94.2	34.9	9	12	20	90x236	HCGF62G203□F236
	22 000	99.6	36.9	8	11	29	101x237 ^{*)}	HCGF62G223□G237
102.0		37.8	8	11	29	101x250	HCGF62G223□G250	
27 000	119.0	44.1	7	10	29	101x283	HCGF62G273□G283	
450 2W (500)	1 800	17.0	6.3	77	80	17	51x115	HCGF62W182□C115
	2 200	19.5	7.2	63	65	18	64x96	HCGF62W222□D096
		19.9	7.4	63	65	17	51x130	HCGF62W222□C130
	2 700	21.3	7.9	52	54	18	64x96	HCGF62W272□D096
	3 300	25.2	9.3	42	44	20	77x96	HCGF62W332□E096
		25.4	9.4	42	44	18	64x115	HCGF62W332□D115
	3 900	28.9	10.7	38	40	18	64x130	HCGF62W392□D130
	4 700	32.0	11.8	34	36	20	77x115	HCGF62W472□E115
	5 600	36.6	13.6	31	33	20	77x130	HCGF62W562□E130
	6 800	43.5	16.1	25	27	20	77x155	HCGF62W682□E155
	8 200	47.5	17.6	21	23	20	90x131	HCGF62W822□F131
		52.5	19.4	21	23	20	77x195	HCGF62W822□E195
	10 000	58.0	21.5	17	19	20	90x171	HCGF62W103□F171
	12 000	65.5	24.3	16	18	29	101x175	HCGF62W123□G175
		67.4	25.0	16	18	20	90x196	HCGF62W123□F196

HCGF6 Series

Screw-Terminal

6 000 h / 85°C

Rated Voltage Code (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 40°C/120Hz [A RMS]	Ripple Current at 85°C/120Hz I_r [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	ESL (typ) [nH]	DxL [mm]	Product Code
450 2W (500)	15 000	76.4	28.3	15	17	29	101x195	HCGF62W153□G195
		79.2	29.4	15	17	20	90x221	HCGF62W153□F221
		81.4	30.1	15	17	20	90x236	HCGF62W153□F236
	16 000	81.8	30.3	16	18	20	90x221	HCGF62W163□F221
	17 000	86.7	32.1	15	17	20	90x236	HCGF62W173□F236
	18 000	90.2	33.4	14	16	29	101x237 ^{*)}	HCGF62W183□G237
		92.2	34.2	14	16	29	101x250	HCGF62W183□G250
	22 000	107.4	39.8	12	14	29	101x283	HCGF62W223□G283
500 2H (550)	1 200	14.0	5.2	112	120	17	51x115	HCGF62H122□C115
		14.3	5.3	112	120	18	64x96	HCGF62H122□D096
	1 500	15.8	5.9	90	96	18	64x96	HCGF62H152□D096
		16.1	6.0	90	96	17	51x130	HCGF62H152□C130
	1 800	18.6	6.9	75	80	18	64x115	HCGF62H182□D115
	2 200	21.6	8.0	61	65	18	64x130	HCGF62H222□D130
		24.0	8.9	61	65	20	77x145	HCGF62H222□E145
	2 700	24.6	9.1	50	53	20	77x115	HCGF62H272□E115
	3 300	28.4	10.5	45	48	20	77x130	HCGF62H332□E130
	3 900	32.9	12.2	38	41	20	77x155	HCGF62H392□E155
	4 700	36.0	13.3	34	37	20	90x131	HCGF62H472□F131
		37.6	13.9	34	37	20	77x171	HCGF62H472□E171
	5 600	41.9	15.5	28	31	20	90x157	HCGF62H562□F157
		43.1	16.0	28	31	20	77x195	HCGF62H562□E195
	6 800	47.8	17.7	23	25	20	90x171	HCGF62H682□F171
	8 200	54.0	20.0	21	23	29	101x175	HCGF62H822□G175
		55.6	20.6	21	23	20	90x196	HCGF62H822□F196
	10 000	62.1	23.0	17	19	29	101x195	HCGF62H103□G195
		64.8	24.0	17	19	20	90x221	HCGF62H103□F221
		66.4	24.6	17	19	20	90x236	HCGF62H103□F236
	12 000	72.9	27.0	16	18	20	90x236	HCGF62H123□F236
		73.6	27.3	16	18	29	101x237 ^{*)}	HCGF62H123□G237
	15 000	82.4	30.5	14	16	29	101x237 ^{*)}	HCGF62H153□G237

^{*)} For Bolt - Mounting dimensions are 101x242mm.

► **Life Time Table / Brauchbarkeitsdauer – Tabelle**

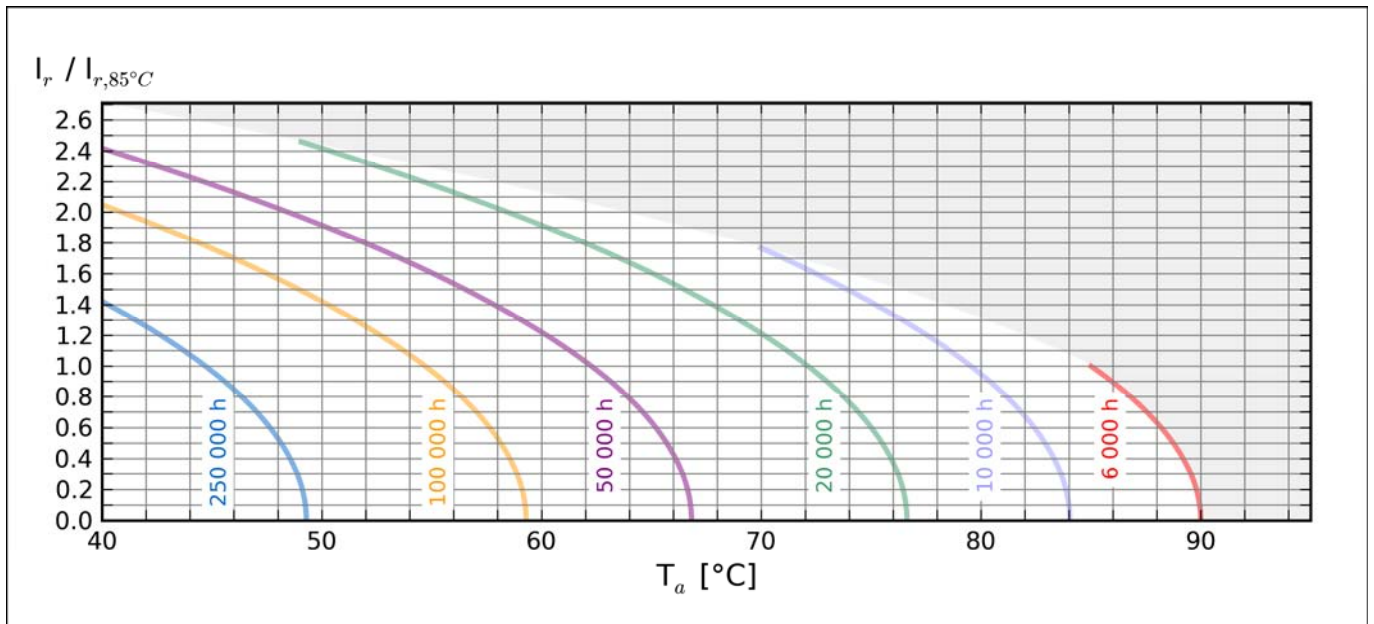
HCGF6 I _r at 85°C	Useful life as function of ambient temperature and ripple current												
	x 1.0	x 1.2	x 1.4	x 1.6	x 1.8	x 2.0	x 2.1	x 2.2	x 2.3	x 2.4	x 2.5	x 2.6	x 2.7
T _a = 40°C	250	250	250	199	149	108	91	76	63	51	42	33	27
T _a = 45°C	243	201	162	125	94	68	57	48	39	32	26	21	
T _a = 50°C	153	127	102	79	59	43	36	30	25	20			
T _a = 55°C	97	80	64	50	37	27	23	19					
T _a = 60°C	61	51	41	31	23	17							
T _a = 65°C	38	32	25	20	15								
T _a = 70°C	24	20	16	12									
T _a = 75°C	15	12	10										
T _a = 80°C	9	8											
T _a = 85°C	6												

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 Kategoriemperatur 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°C; V _r , I _r applied 4000 hours	ΔC/C ≤ 15% (of initial value) Tanδ ≤ 175% (of specified value) I _L ≤ specified value
Useful life	T _a = 85°C; V _r , I _r applied 6000 hours	ΔC/C ≤ 20% (of initial value) Tanδ < 200% (of specified value) I _L ≤ specified value

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