HCGW2 · Screw-Terminal · 6000 h/85 °C

Higher capacitance · Ultra compact · Double Anode Technology
Suited for optional permanent Charge-Discharge Design

Special charge-discharge proof design available upon request.

Auf Anfrage spezielles Design für Lade-, Entladeanwendungen erhältlich.

› Specifications · Spezifikationen

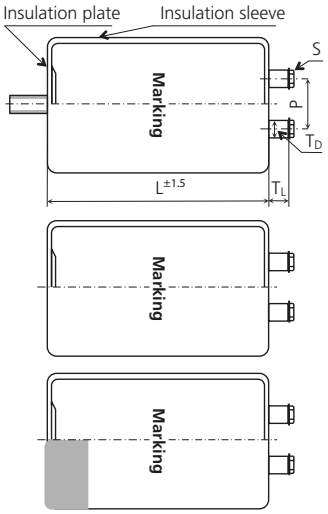
Items	Characteristics
Temperature range	-10°C ~ + 85°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage	Repetitive max. 30 sec per 6 Minutes
Leakage current max. I_L (20°C, 5 min)	0.01 • C • V_r [µA] or 7 mA, which is smaller.
Useful life	6 000 hours at 85°C
Field failure 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

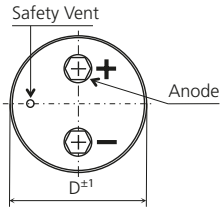
› Outline Drawings · Bauformen

Shape: B (ØD = 77-90)
(for Bolt – Mounting, M12x16, stud bolt is not isolated)
Form: B (ØD = 77-90)
(für Bolzenbefestigung, M12x16, Bolzen nicht isoliert)

Shape: N, (for PBT-Holder ØD = 77-90 and Press Ring ØD = 77-90)
Form: N, (für PBT-Halter ØD = 77-90 und Einpressring ØD = 77-90)

Shape: Y (ØD = 77-90)
(double sleeve,Y- bracket free of charge)
Form: Y (ØD = 77-90)
(mit doppelter Isolierung, Y-Schelle wird kostenlos mitgeliefert)





ØD	P	S	T_L	T_D	Cap material
77	31.5	M6x12	9.0	12	PH
		M5x10	8.0	11	PH
90	31.5	M6x12	8.0	12	PH

Size in mm. First listed terminal is standard.

› Product Code · Bestellbezeichnung

Example: Series HCGW2 · 29000 µF · +/- 20 % · 400 V · D=90 mm · L=230 mm with Y-Bracket

HCGW2 **2G** **293** **Y** **F** **230** **( )**

Type of series

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

Rated voltage code

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

Fixing symbol code
B : Bolt Ø
D = 51 - 101
N : No double sleeve (PBT-Safety-holder or press ring)
ØD = 51 - 101
Y : 3 Stoppers Bracket
ØD = 51 - 101

Case code diameter

ØD	Code
77	E
90	F

Customers` specification

Case Code length
Length in mm (3 digits)

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Rated VoltageCode (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 δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
400 VDC Code: 2G Surge Voltage 450 VDC	**13 000**	13.0	32.5	26	27	20	0.2	77x148	HCGW22G133#E148
	14 000	13.4	33.5	24	25	20	0.2	77x148	HCGW22G143#E148
	16 000	15.5	38.8	21	22	20	0.2	77x188	HCGW22G163#E188
	18 000	16.4	41.0	19	20	20	0.2	90x150	HCGW22G183#F150
	19 000	17.5	43.8	18	20	20	0.2	90x167	HCGW22G193#F167
	20 000	18.8	47.0	17	18	20	0.2	77x228	HCGW22G203#E228
	23 000	19.8	49.5	15	16	20	0.2	90x190	HCGW22G233#F190
	29 000	23.9	59.8	12	13	20	0.2	90x230	HCGW22G293#F230
450 VDC Code: 2W Surge Voltage 500 VDC	**10 000**	10.9	27.3	40	42	20	0.2	77x148	HCGW22W103#E148
	12 000	12.5	31.3	33	35	20	0.2	77x165	HCGW22W123#E165
	14 000	13.8	34.5	29	30	20	0.2	77x188	HCGW22W143#E188
	15 000	14.3	35.8	27	29	20	0.2	90x150	HCGW22W153#F150
	17 000	15.8	39.5	24	26	20	0.2	90x167	HCGW22W173#F167
	18 000	17.0	42.5	22	23	20	0.2	77x228	HCGW22W183#E228
	20 000	17.6	44.0	20	21	20	0.2	90x190	HCGW22W203#F190
	25 000	21.2	53.0	16	17	20	0.2	90x230	HCGW22W253#F230
500 VDC Code: 2H Surge Voltage 550 VDC	**7 500**	9.5	23.8	47	48	20	0.2	77x148	HCGW22H752#E148
	9 000	10.9	27.3	40	41	20	0.2	77x165	HCGW22H902#E165
	10 000	11.7	29.3	36	38	20	0.2	77x188	HCGW22H103#E188
	11 000	12.2	30.5	33	34	20	0.2	90x150	HCGW22H113#F150
	13 000	14.5	36.3	28	29	20	0.2	77x228	HCGW22H133#E228
		14.0	35.0	28	29	20	0.2	90x167	HCGW22H133#F167
	15 000	15.3	38.3	24	25	20	0.2	90x190	HCGW22H153#F190
	18 000	18.1	45.3	20	21	20	0.2	90x230	HCGW22H183#F230
	19 000	18.5	46.3	19	20	20	0.2	90x230	HCGW22H193#F230

› Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	≥ 10k
Multiplier	0.70	1.00	1.18	1.34	1.45

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

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

Additional designs on request · Weitere Designs auf Anfrage

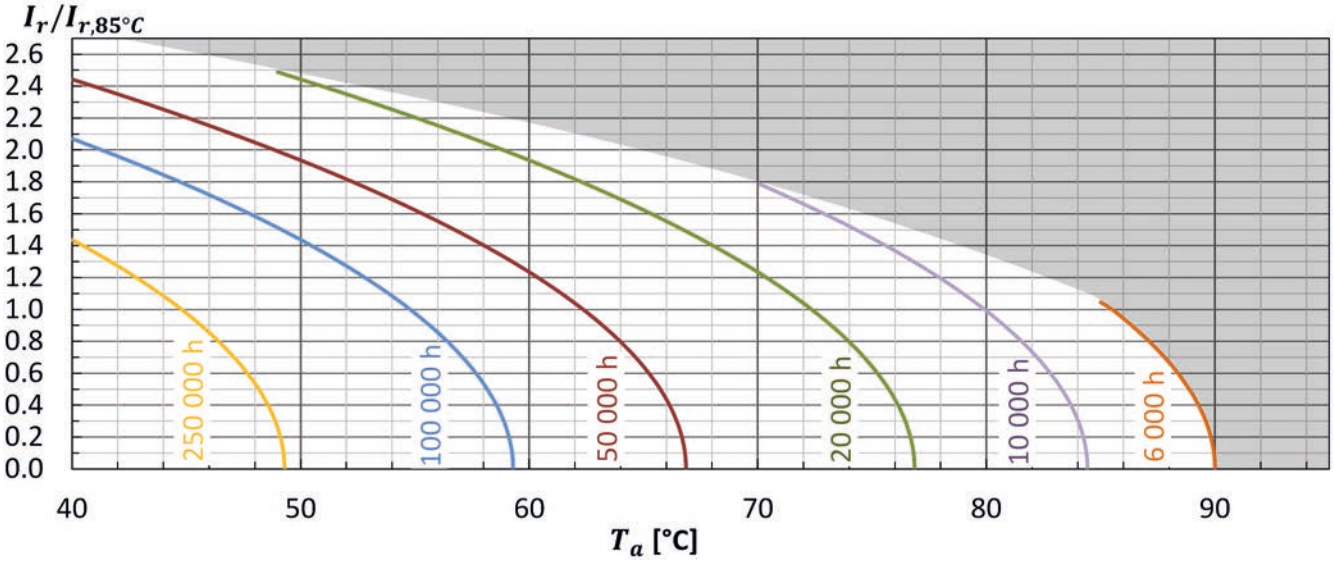
› Life Time Table · Brauchbarkeitsdauer – Tabelle

HCGW2	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	203	154	132	112	95	79	66	54	44
T_a = 45°C	245	204	165	128	97	83	71	60	50	41	34	
T_a = 50°C	155	129	104	81	61	52	45	38	31	26		
T_a = 55°C	98	81	66	51	38	33	28	24	20			
T_a = 60°C	62	51	41	32	24	21	18					
T_a = 65°C	39	32	26	20	15							
T_a = 70°C	24	20	16	13								
T_a = 75°C	15	13	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 Kategorietemperatur $I_{r,\ 85°C,120Hz}$



› 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