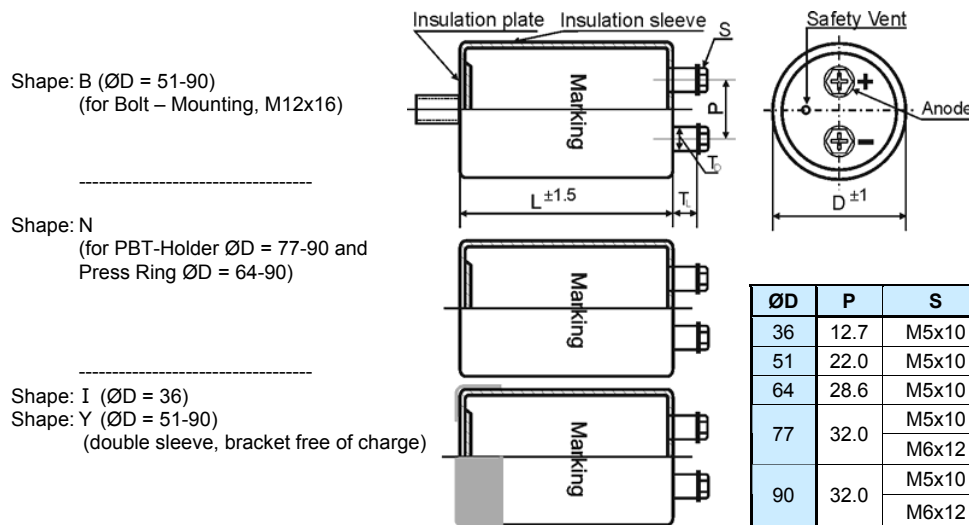


► Specifications /

Items	Characteristics
Temperature range	-25°C ~ + 85°C
Rated voltage V_r	350 VDC - 450 VDC
Surge voltage	Repetitive max. 30 sec per 6 Minutes
Leakage current max. I_L (20°C, 5 min)	$0.01 \cdot C \cdot V_r$ [μ A] or 3 mA, which is smaller.
Capacitance tolerance	+/- 20%
Useful life	10000 h at 85°C
Field failure rate	$0.5 \text{ FIT} = 0.5 \cdot 10^{-9}$ Failures/hour
Failure rate	Less than 0.1% within the useful life



► Outline Drawing /



ØD	P	S	T _L	T _D	Cap material
36	12.7	M5x10	7.0	8	PPS
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

Size in mm. First listed terminal is standard.

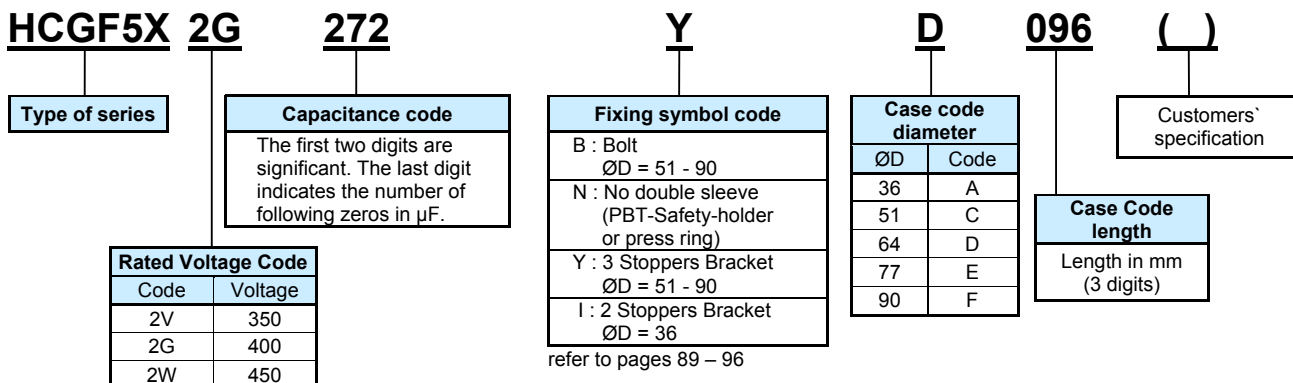
► Ripple Current Multiplier /

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 /

Example: 2700µF 400V D=64mm L=96mm with Y-Bracket



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)	390	5.3	2.5	230	237	15	36x53	HCGF5X2V391□A053
	470	7.1	3.4	190	196	15	36x83	HCGF5X2V471□A083
	560	7.7	3.7	173	178	15	36x83	HCGF5X2V561□A083
	680	8.6	4.1	154	158	15	36x83	HCGF5X2V681□A083
	820	10.4	5.0	127	130	15	36x100	HCGF5X2V821□A100
	1 200	13.1	6.2	94	96	17	51x75	HCGF5X2V122□C075
	1 500	14.6	6.9	74	80	17	51x75	HCGF5X2V152□C075
	1 800	17.5	8.3	62	64	17	51x96	HCGF5X2V182□C096
	2 200	19.6	9.3	51	56	17	51x96	HCGF5X2V222□C096
	2 700	24.4	11.6	42	46	17	51x130	HCGF5X2V272□C130
		33.1	15.8	42	46	20	77x105	HCGF5X2V272□E105
	3 300	25.8	12.3	38	39	18	64x96	HCGF5X2V332□D096
		27.0	12.9	38	41	17	51x130	HCGF5X2V332□C130
	3 900	30.9	14.7	34	38	18	64x115	HCGF5X2V392□D115
	4 700	35.0	16.7	29	32	18	64x130	HCGF5X2V472□D130
	5 600	38.9	18.5	27	28	20	77x115	HCGF5X2V562□E115
	6 800	44.8	21.4	22	23	20	77x130	HCGF5X2V682□E130
		46.8	22.3	22	23	20	77x143	HCGF5X2V682□E143
	8 200	52.6	25.0	18	20	20	77x155	HCGF5X2V822□E155
	10 000	61.8	29.4	15	18	20	90x157	HCGF5X2V103□F157
	12 000	68.3	32.5	13	17	20	90x157	HCGF5X2V123□F157
	15 000	83.8	39.9	10	16	20	90x196	HCGF5X2V153□F196
	18 000	98.3	46.8	8	16	20	90x236	HCGF5X2V183□F236
23 000	103.5	49.3	6	14	20	90x196	HCGF5X2V233□F196	
400 2G (450)	330	5.0	2.4	294	302	15	36x53	HCGF5X2G331□A053
	390	6.5	3.1	267	275	15	36x83	HCGF5X2G391□A083
	470	7.1	3.4	222	228	15	36x83	HCGF5X2G471□A083
	560	7.7	3.7	186	190	15	36x83	HCGF5X2G561□A083
	680	9.5	4.5	153	157	15	36x100	HCGF5X2G681□A100
	820	10.4	5.0	127	130	15	36x100	HCGF5X2G821□A100
	1 000	11.9	5.7	112	120	17	51x75	HCGF5X2G102□C075
	1 200	13.1	6.2	94	100	17	51x75	HCGF5X2G122□C075
	1 500	16.0	7.6	80	86	17	51x96	HCGF5X2G152□C096
	1 800	17.5	8.3	66	72	17	51x96	HCGF5X2G182□C096
	2 200	21.5	10.2	54	60	18	64x96	HCGF5X2G222□D096
		22.0	10.5	54	60	17	51x130	HCGF5X2G222□C130
	2 700	23.8	11.3	47	53	18	64x96	HCGF5X2G272□D096
		27.9	13.3	38	42	18	64x115	HCGF5X2G332□D115
	3 300	28.7	13.7	38	42	20	77x105	HCGF5X2G332□E105
		32.4	15.5	38	42	20	77x143	HCGF5X2G332□E143
	3 900	32.1	15.3	34	38	18	64x130	HCGF5X2G392□D130
	4 700	35.6	17.0	29	33	20	77x115	HCGF5X2G472□E115
		38.6	18.4	29	26	20	77x143	HCGF5X2G472□E143
	5 600	40.7	19.4	26	30	20	77x130	HCGF5X2G562□E130
	6 800	46.9	22.3	21	24	20	77x145	HCGF5X2G682□E145
		48.1	22.9	21	24	20	77x155	HCGF5X2G682□E155
	8 200	56.1	26.7	18	21	20	90x157	HCGF5X2G822□F157
10 000	62.4	29.7	15	18	20	90x157	HCGF5X2G103□F157	
12 000	74.8	35.6	13	17	20	90x196	HCGF5X2G123□F196	
15 000	89.7	42.7	12	17	20	90x236	HCGF5X2G153□F236	
450 2W (500)	270	4.5	2.1	386	397	15	36x53	HCGF5X2W271□A053
	330	6.2	3.0	316	325	15	36x83	HCGF5X2W331□A083
	390	6.5	3.1	267	274	15	36x83	HCGF5X2W391□A083
	470	7.1	3.4	222	227	15	36x83	HCGF5X2W471□A083
	560	8.6	4.1	186	190	15	36x100	HCGF5X2W561□A100
	680	9.5	4.5	153	157	15	36x100	HCGF5X2W681□A100
	820	11.0	5.2	146	150	17	51x75	HCGF5X2W821□C075
	1 000	11.9	5.7	119	123	17	51x75	HCGF5X2W102□C075

HCGF5X Series

Screw-Terminal

10 000 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)	1 200	14.3	6.8	99	103	17	51x96	HCGF5X2W122□C096
	1 500	17.5	8.3	80	86	17	51x115	HCGF5X2W152□C115
	1 800	19.9	9.5	74	80	17	51x130	HCGF5X2W182□C130
	2 200	21.4	10.2	62	67	18	64x96	HCGF5X2W222□D096
		28.7	13.7	62	67	20	77x103	HCGF5X2W222□E103
	2 700	25.5	12.2	50	55	18	64x115	HCGF5X2W272□D115
	3 300	29.4	14.0	41	49	20	77x115	HCGF5X2W332□E115
		29.7	14.1	43	49	18	64x130	HCGF5X2W332□D130
		32.1	15.3	43	49	20	77x143	HCGF5X2W332□E143
	3 700	30.6	14.6	39	43	20	77x105	HCGF5X2W372□E105
	3 900	32.4	15.4	37	41	20	77x115	HCGF5X2W392□E115
	4 700	36.8	17.5	30	34	20	77x130	HCGF5X2W472□E130
	5 600	43.7	20.8	26	30	20	77x155	HCGF5X2W562□E155
	6 800	49.5	23.6	22	26	20	90x145	HCGF5X2W682□F145
		51.1	24.3	22	26	20	90x157	HCGF5X2W682□F157
	8 200	56.4	26.9	20	24	20	90x157	HCGF5X2W822□F157
	10 000	60.1	28.6	16	20	20	90x145	HCGF5X2W103□F145
		68.0	32.4	17	21	20	90x196	HCGF5X2W103□F196
12 000	80.5	38.3	15	18	20	90x236	HCGF5X2W123□F236	

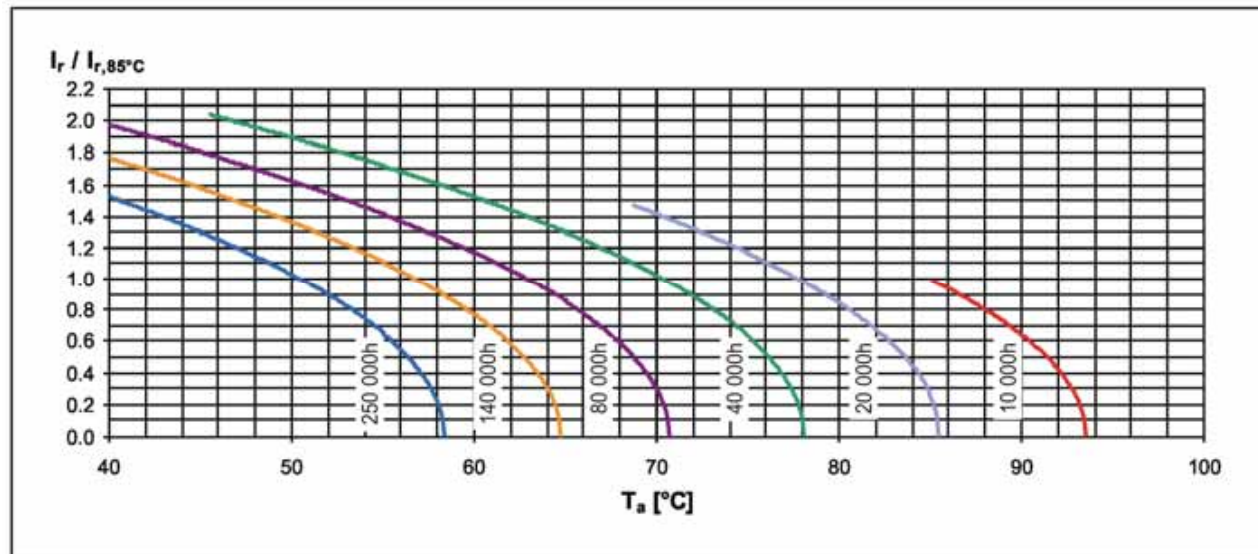
► Life Time Table /

HCGF5X I_r at 85°C	Useful life as function of ambient temperature and ripple current											
	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	x 2.1
$T_a = 40^\circ\text{C}$	250	250	250	250	250	250	211	166	129	99	74	55
$T_a = 45^\circ\text{C}$	250	250	250	250	206	167	133	105	82	62	47	
$T_a = 50^\circ\text{C}$	250	224	190	158	130	106	84	66	52	39		
$T_a = 55^\circ\text{C}$	165	142	120	100	82	67	53	42	33			
$T_a = 60^\circ\text{C}$	104	90	76	63	52	42	34	27				
$T_a = 65^\circ\text{C}$	66	57	48	40	33	27						
$T_a = 70^\circ\text{C}$	41	36	30	25	21							
$T_a = 75^\circ\text{C}$	26	22	19	16								
$T_a = 80^\circ\text{C}$	16	14										
$T_a = 85^\circ\text{C}$	10											

khrs Max. value limited to 250 000 hours.

► Life Time Graph /

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



► Life Time Tests and Requirements /

Life time test	Reference	Test procedure	Life time criteria
Endurance test	JIS-C-5101-4 JIS-C-5102 IEC 60384-4	$T_a = 85^\circ\text{C}$; V_r, I_r applied 6000 hours	$\Delta C/C < 15\%$ $\text{Tan}\delta < 175\%$ (of initial value) $I_L = \text{spec. value}$
Useful life	JIS-C-5104-4 IEC 60384-4	$T_a = 85^\circ\text{C}$; V_r, I_r applied 10000 hours	$\Delta C/C < 20\%$ $\text{Tan}\delta < 200\%$ (of initial value) $I_L = \text{spec. value}$