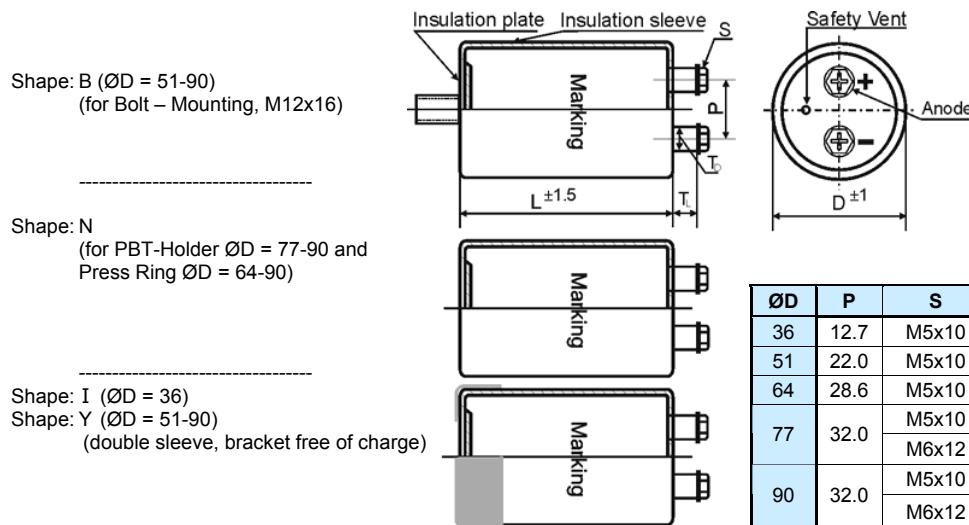


► Specifications /

Items	Characteristics
Temperature range	-25°C ~ + 85°C
Rated voltage V_r	160 VDC - 250 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	6000 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.

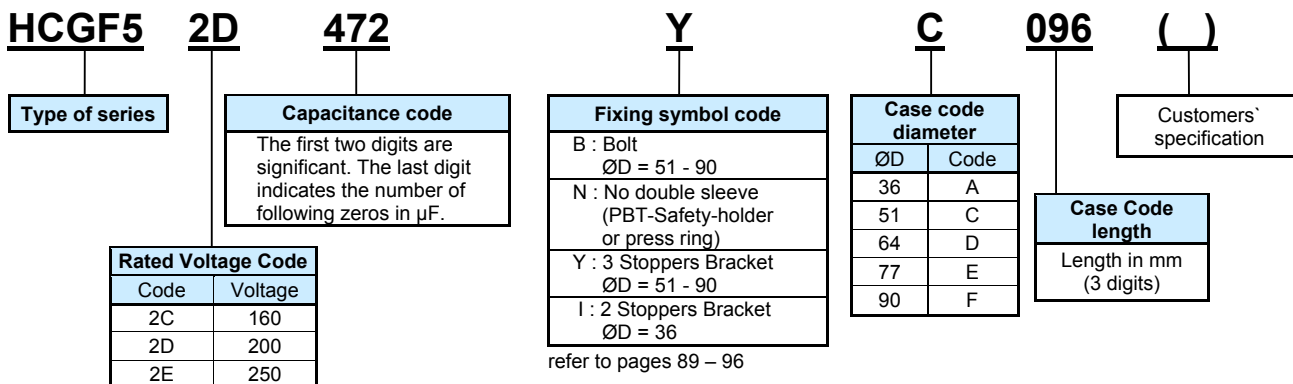
► Ripple Current Multiplier /

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: 4700µF 200V D=51mm 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
160 2C (200)	3 300	16.2	6.0	40	30	15	36x121	HCGF52C332□A121
	3 900	16.5	6.1	37	28	17	51x75	HCGF52C392□C075
	4 700	18.1	6.7	30	25	17	51x75	HCGF52C472□C075
	5 600	21.6	8.0	26	23	17	51x96	HCGF52C562□C096
	6 800	24.3	9.0	21	21	17	51x96	HCGF52C682□C096
	8 200	28.4	10.5	18	19	17	51x115	HCGF52C822□C115
	10 000	32.4	12.0	14	17	18	64x96	HCGF52C103□D096
		32.9	12.2	15	16	17	51x130	HCGF52C103□C130
	12 000	35.1	13.0	12	15	18	64x96	HCGF52C123□D096
	15 000	44.3	16.4	11	12	18	64x130	HCGF52C153□D130
	18 000	48.3	17.9	9	11	18	64x130	HCGF52C183□D130
	22 000	56.7	21.0	8	8	20	77x130	HCGF52C223□E130
	27 000	62.6	23.2	7	8	20	77x130	HCGF52C273□E130
	33 000	74.0	27.4	6	7	20	90x131	HCGF52C333□F131
39 000	86.7	32.1	5	7	20	90x157	HCGF52C393□F157	
68 000	115.0	42.6	4	6	20	90x203	HCGF52C683□F203	
200 2D (250)	2 200	12.2	4.5	51	45	15	36x100	HCGF52D222□A100
	2 700	14.6	5.4	48	39	15	36x121	HCGF52D272□A121
	3 300	15.1	5.6	43	35	17	51x75	HCGF52D332□C075
	3 900	16.5	6.1	37	30	17	51x75	HCGF52D392□C075
	4 700	20.0	7.4	30	27	17	51x96	HCGF52D472□C096
	5 600	23.2	8.6	26	25	17	51x115	HCGF52D562□C115
	6 800	27.3	10.1	21	20	17	51x130	HCGF52D682□C130
	8 200	29.2	10.8	17	18	18	64x96	HCGF52D822□D096
	10 000	32.4	12.0	14	14	18	64x96	HCGF52D103□D096
	12 000	37.5	13.9	12	14	20	77x96	HCGF52D123□E096
	15 000	44.8	16.6	10	13	20	77x96	HCGF52D153□E096
	18 000	51.3	19.0	8	12	20	77x130	HCGF52D183□E130
	20 000	56.7	21.0	8	8	20	77x145	HCGF52D203□C145
	22 000	60.8	22.5	7	7	20	77x155	HCGF52D223□E155
27 000	67.0	24.8	6	7	20	90x131	HCGF52D273□F131	
33 000	79.1	29.3	5	7	20	90x157	HCGF52D333□F157	
250 2E (300)	1 500	10.0	3.7	56	50	15	36x100	HCGF52E152□A100
	1 800	10.8	4.0	52	44	15	36x100	HCGF52E182□A100
	2 200	12.4	4.6	50	40	17	51x75	HCGF52E222□C075
	2 700	13.8	5.1	41	36	17	51x75	HCGF52E272□C075
	3 300	16.7	6.2	36	35	17	51x96	HCGF52E332□C096
	3 900	19.4	7.2	31	30	17	51x115	HCGF52E392□C115
	4 700	22.1	8.2	25	23	18	64x96	HCGF52E472□D096
	5 600	24.3	9.0	21	21	18	64x96	HCGF52E562□D096
	6 800	28.4	10.5	18	18	18	64x115	HCGF52E682□D115
	8 200	31.0	11.5	15	16	18	64x115	HCGF52E822□D115
	10 000	36.4	13.5	12	14	18	64x130	HCGF52E103□D130
	12 000	40.0	14.8	10	11	20	77x115	HCGF52E123□E115
	15 000	47.0	17.4	8	11	20	77x130	HCGF52E153□E130
	18 000	55.1	20.4	7	10	20	77x155	HCGF52E183□E155
22 000	64.8	24.0	6	8	20	90x157	HCGF52E223□F157	

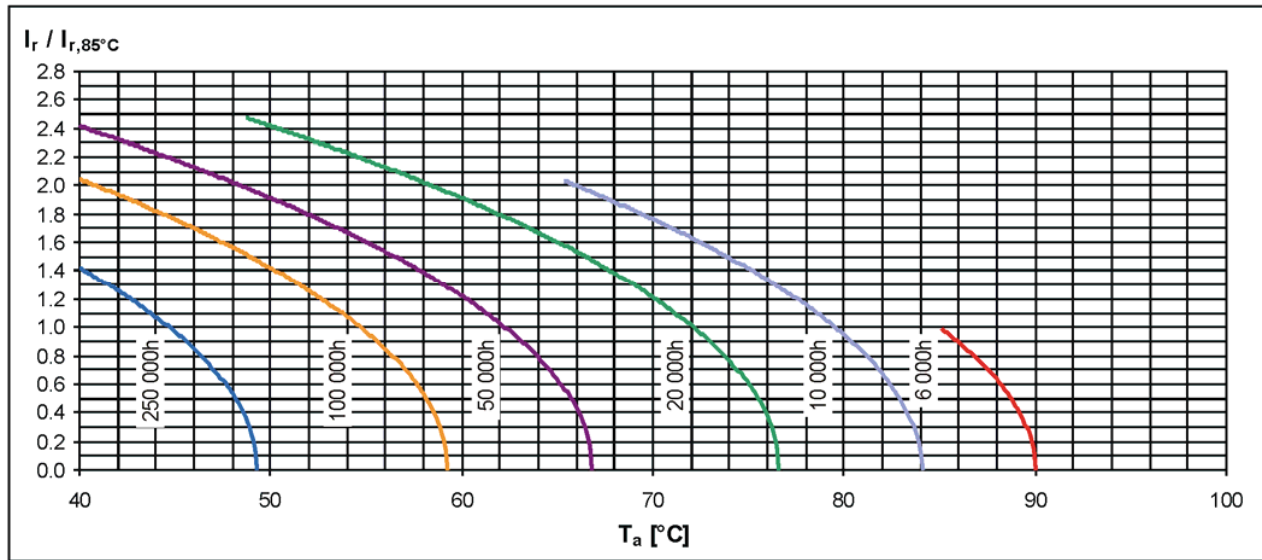
► **Life Time Table /**

HCGF5	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 2.0	x 2.1	x 2.2	x 2.3	x 2.4	x 2.5	x 2.6	x 2.7
$T_a = 40^\circ\text{C}$	250	250	250	199	150	109	91	76	63	52	42	34	27
$T_a = 45^\circ\text{C}$	243	202	162	126	95	69	58	48	40	33	27		
$T_a = 50^\circ\text{C}$	154	128	103	80	60	43	37	30	25	21			
$T_a = 55^\circ\text{C}$	97	81	65	50	38	27	23	19	16				
$T_a = 60^\circ\text{C}$	62	51	41	32	24	17	15						
$T_a = 65^\circ\text{C}$	39	32	26	20	15	11							
$T_a = 70^\circ\text{C}$	25	20	16	13	10								
$T_a = 75^\circ\text{C}$	16	13	10										
$T_a = 80^\circ\text{C}$	10	8											
$T_a = 85^\circ\text{C}$	6												

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 4000 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 6000 hours	$\Delta C/C < 20\%$ $\text{Tan}\delta < 200\%$ (of initial value) $I_L = \text{spec. value}$