CATEGORY 5

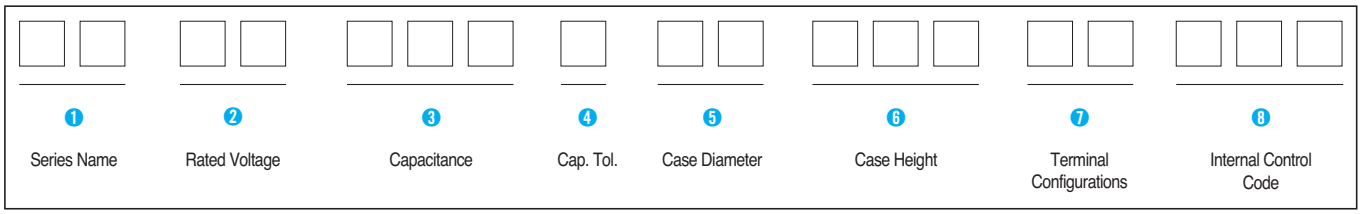
LARGE

ALUMINUM ELECTROLYTIC CAPACITORS



PART NUMBER SYSTEM

Part Number System



1 Series Name

See page 8

2 Rated Working Voltage

WV	6.3	10	16	25	35
Code	0J	1A	1C	1E	1V

WV	40	50	63	80	100
Code	1G	1H	1J	1K	2A

WV	160	200	220	250	315
Code	2C	2D	7D	2E	2F

WV	330	350	360	375	400
Code	2L	2V	2Z	7S	2G

WV	450	475	500	550	600
Code	2W	7W	2H	7H	2X

3 Capacitance

ex) 47μF 476
470μF 477
4700μF 478
47000μF 479

4 Capacitance Tolerance

Tolerance (%)	±10	±15	±20	0 +20	−10 +20	−10 +30	−10 +50	−10 +75
Code	K	L	M	W	V	Q	T	U

5 Case Diameter

ex) ø22 22
ø25.4 25
ø30 30
ø35 35
ø40 40
ø51 51
ø63.5 64
ø76.2 76
ø89 89

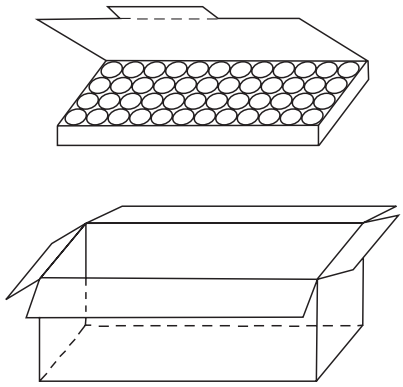
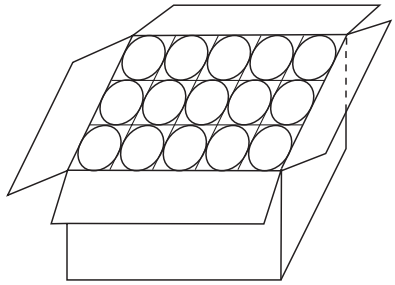
6 Case Height

ex) 30mm 030
105mm 105

7 Terminal Configurations

Terminal Configurations		Code
Snap-in Terminal for PC board mounting	Terminal Length 6mm	HA
	Terminal Length 4mm	HC
Lug Terminal for Soldering	ØD ≦ 35	LC
	ØD = 40	LA
	ØD = 51	LD
	ØD ≧ 63.5	LE
Photo Flash	ØD = 22	PK
	ØD = 25.4, 30	LC
	ØD = 35	LF
Screw Terminal Type		SB
Screw Terminal Type (Stud Type)		TB
Screw Terminal Type (M6)		S6
Screw Terminal Type (Stud Type, M6)		T6

PACKING

FIGURE 1	FIGURE 2
SNAP-IN TYPE INNER, MIDDLE BOX	SCREW TYPE BOX
	

● SNAP-IN TYPE PACKAGING Quantity (pcs) / BOX (FIGURE 1)

SIZE		SNAP-IN(QUANTITY)	
ØD	L	INNER BOX	MIDDLE BOX
22	20 ~ 40	200	600
	45 ~ 50		
25	20 ~ 45	150	450
	50 ~ 60	150	300
30	20 ~ 40	100	300
	45 ~ 55		
	60 ~ 80	100	200
35	20 ~ 40	50	200
	45 ~ 55		
	60 ~ 80		150
	100 ~ 120		100
40	25 ~ 40	50	150
	50		
	60 ~ 80		
	90 ~ 110		100

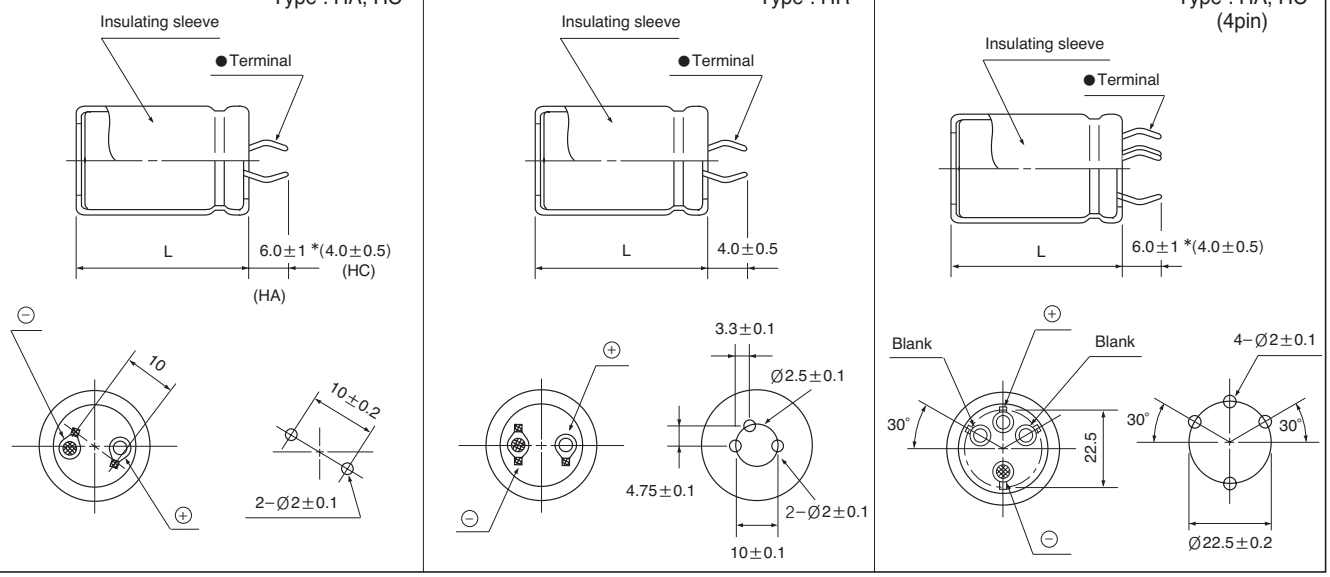
● SCREW TYPE PACKAGING Quantity (pcs) / BOX & BOX SIZE (FIGURE 2)

SIZE	SCREW
ØD	QUANTITY
35	45
51	23
64	16
76	12
89	9

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

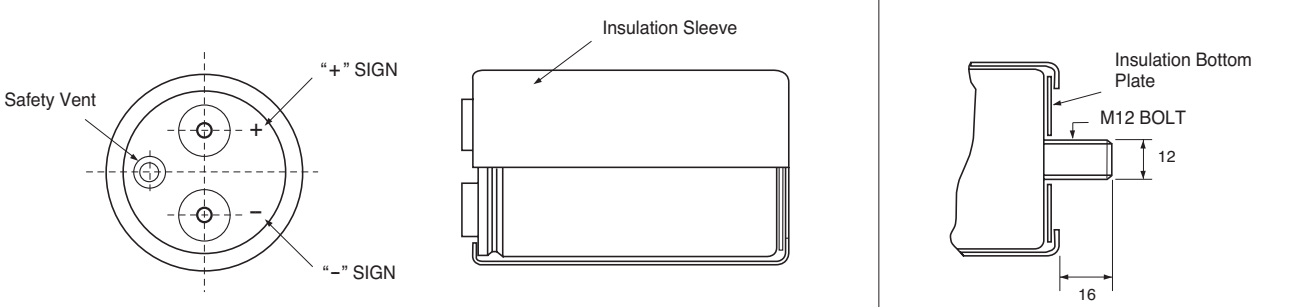
● SNAP-IN DRAWING

STANDARD 2 PIN (Ø22~Ø40)	2 PIN - 1 (Ø25, Ø30, Ø35)	4 PIN (Ø35, Ø40)
Type : HA, HC	Type : HR	Type : HA, HC (4pin)



● SCREW CASE DRAWING

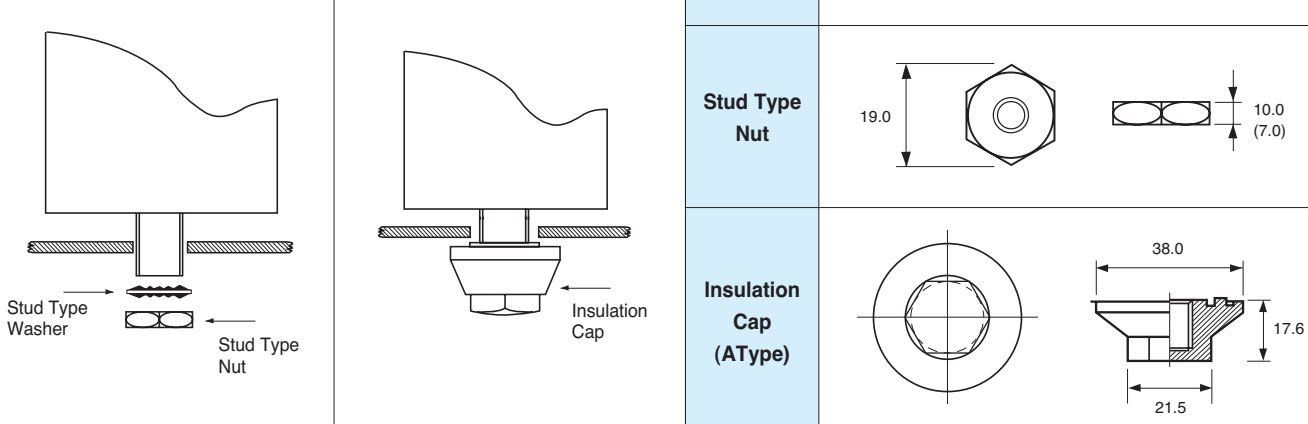
STANDARD	STUD TYPE
Type : SB	Type : TB



(ONLY Ø51, 64, 76)

● STUD TYPE DRAWING

NON-INSULATED VERSION	INSULATED VERSION		
		Stud Type Washer	
		Stud Type Nut	
		Insulation Cap (AType)	



HC Snap-in Terminal Type, Standard Series

Solvent Proof
WV≦100V



- Standard snap-in terminal type
- Including 550WV products
- Complied to the RoHS directive

HE ⇦ Wide temp. **HC** ⇨ HJ Long life

Item	Characteristics
Operating temperature range	WV< 350 : -40 ~ +85˚C, WV≧350 : -25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

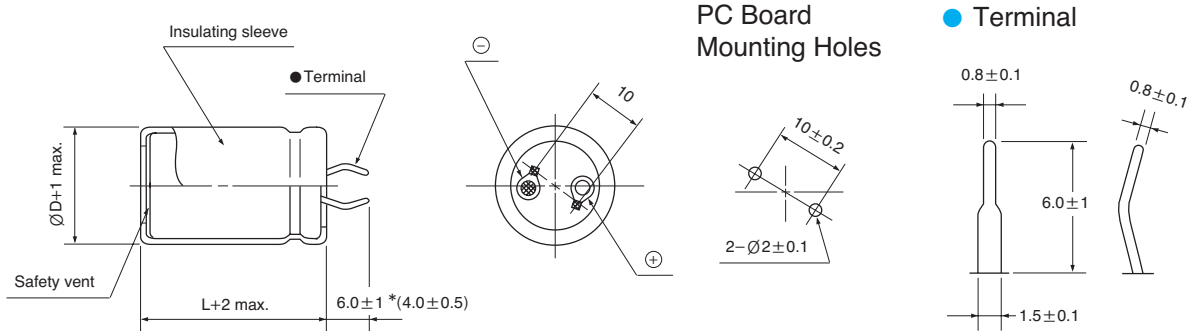
WV	6.3	10	16, 25	35	50, 63	80, 100	160 ~ 400	450~550
tanδ	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.20

Load life (after application of the rated voltage for 2000 hours at 85˚C)		
	Leakage current	Less than specified value
	Capacitance change	Within ±20% of initial value
	tanδ	Less than 200% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4	

DRAWING

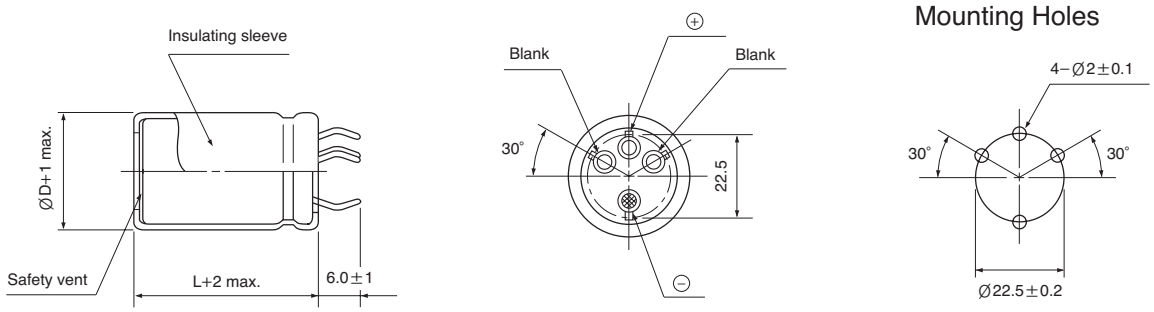
Unit : mm

ØD≤40



∗ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

ØD=35, 40



FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
315 ~	0.85	1.00	1.15	1.20	1.40

HC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF \ ØD	6.3					10					16				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
10000											22×25 3.32				
12000						22×25 3.31					22×30 3.55	25.4×25 3.89			
15000	22×25 3.39					22×30 3.42	25.4×25 3.39				22×35 4.29	25.4×30 4.45	30×25 4.56		
18000	22×30 3.85	25.4×25 3.96				22×35 4.28	25.4×25 4.17				22×40 4.77	25.4×35 4.96	30×30 5.10		
22000	22×35 4.34	25.4×25 4.22				22×40 4.79	25.4×30 4.71	30×25 4.83			22×50 5.51	25.4×40 5.51	30×30 5.39		
27000	22×40 4.85	25.4×30 4.77	30×25 4.89			22×45 5.30	25.4×35 5.26	30×30 5.41				25.4×45 6.06	30×35 5.98	35×25 5.80	
33000	22×45 5.36	25.4×35 5.32	30×30 5.47			22×50 5.82	25.4×40 5.81	30×30 5.69	35×25 5.81				30×40 6.56	35×30 6.41	
39000	22×50 5.83	25.4×40 5.82	30×30 5.70	35×25 5.82			25.4×45 6.31	30×35 6.22	35×30 6.38				30×45 7.08	35×35 6.96	
47000		25.4×45 6.35	30×35 6.26	35×30 6.41			25.4×50 6.83	30×40 6.78	35×30 6.62				30×50 7.62	35×40 7.54	
56000		25.4×50 6.85	30×40 6.80	35×30 6.64				30×45 7.31	35×35 7.18					35×45 8.08	40×40 8.23
68000			30×45 7.35	35×35 7.23					35×40 7.76					35×50 8.63	40×50 9.13
100000				35×45 8.34	40×40 8.49					40×50 9.35					40×60 10.2

WV / μF \ ØD	25					35					50				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
3300											22×30 2.97	25.4×25 3.06			
4700						22×30 3.06	25.4×25 2.98				22×40 3.83	25.4×35 3.98	30×25 3.86	35×25 4.19	
5600	22×25 2.65					22×35 3.28	25.4×30 3.39				22×45 4.26	25.4×40 4.44	30×30 4.35	35×25 4.44	
6800	22×30 3.06	25.4×25 3.15				22×40 3.73	25.4×30 3.67	30×25 3.76			22×50 4.77	25.4×40 4.76	30×35 4.92	35×30 5.04	
8200	22×35 3.45	25.4×30 3.57				22×45 4.13	25.4×35 4.10	30×30 4.22				25.4×50 5.43	30×40 5.38	35×30 5.26	
10000	22×40 3.95	25.4×30 3.89	30×25 3.99			22×50 4.68	25.4×40 4.68	30×30 4.58					30×45 6.07	35×35 5.97	
12000	22×45 4.41	25.4×35 4.37	30×30 4.50				25.4×45 5.18	30×35 5.11	35×30 5.24				30×50 6.62	35×40 6.55	
15000	22×50 4.94	25.4×40 4.94	30×35 5.10					30×40 5.72	35×35 5.88					35×45 7.20	
18000		25.4×45 5.45	30×35 5.38	35×30 5.51				30×45 6.28	35×40 6.46					35×50 7.74	40×40 7.62
22000			30×45 6.22	35×35 6.12					35×45 7.07	40×40 7.20					40×50 8.54
27000			30×50 6.82	35×40 6.74						40×50 8.14					40×60 9.45
33000				35×45 7.35	40×40 7.48					40×50 8.46					

WV / μF \ ØD	63					80					100				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
1200						22×25 2.24					22×30 2.39	25.4×25 2.46			
1500						22×30 2.67					22×35 2.83	25.4×30 2.93	30×25 3.00		
1800	22×25 2.20					22×30 2.92	25.4×25 3.01				22×40 3.26	25.4×35 3.39	30×30 3.49		
2200	22×30 2.50	25.4×25 2.58				22×35 3.25	25.4×30 3.36	30×25 3.45			22×45 3.58	25.4×40 3.74	30×30 3.66		
2700	22×35 2.94	25.4×30 3.04				22×40 3.79	25.4×35 3.94	30×30 4.05				25.4×45 4.33	30×35 4.27	35×30 4.37	
3300	22×35 3.14	25.4×30 3.26	30×25 3.34			22×45 4.18	25.4×40 4.36	30×30 4.27				25.4×50 4.76	30×40 4.72	35×35 4.85	
3900	22×40 3.60	25.4×35 3.74	30×30 3.85			22×50 4.75	25.4×45 4.96	30×35 4.89					30×45 5.36	35×35 5.27	
4700	22×50 4.19	25.4×40 4.19	30×35 4.10	35×30 4.19			25.4×50 5.44	30×40 5.39	35×30 5.27				30×50 5.86	35×40 5.80	
5600		25.4×45 4.65	30×35 4.58	35×30 4.70				30×45 5.91	35×35 5.81					35×45 6.34	40×40 6.45
6800		25.4×50 5.20	30×40 5.16	35×30 5.04					35×40 6.45						40×50 7.40
8200			30×45 5.62	35×35 5.53					35×45 6.91	40×40 7.04					40×50 7.60
10000			30×50 6.32	35×40 6.25						40×50 8.14	← Case size ØD×L (mm)				
12000				35×45 6.83	40×40 6.95						← Ripple current (Arms) at 85°C, 120Hz				

HC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160					200					250				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
150											22×25 0.90	25.4×20 0.92			
180						22×20 0.91					22×25 0.90	25.4×20 1.01			
220	22×20 1.01					22×25 1.09	25.4×20 1.11				22×25 1.09	25.4×25 1.19	30×20 1.22		
270	22×25 1.20	25.4×20 1.32				22×25 1.20	25.4×25 1.32	30×20 1.35			22×30 1.28	25.4×25 1.32	30×20 1.35		
330	22×25 1.33	25.4×20 1.36				22×30 1.42	25.4×25 1.46	30×20 1.49			22×30 1.42	25.4×30 1.56	30×20 1.49		
390	22×25 1.45	25.4×25 1.59	30×20 1.62			22×30 1.54	25.4×25 1.59	30×25 1.74			22×35 1.63	25.4×30 1.69	30×25 1.73		
470	22×30 1.69	25.4×25 1.75	30×20 1.78			22×35 1.79	25.4×30 1.86	30×25 1.90			22×40 1.89	25.4×30 1.84	30×25 1.90	35×25 2.06	
560	22×35 1.96	25.4×30 2.03	30×25 2.08			22×40 2.06	25.4×35 2.14	30×25 2.08	35×25 2.25		22×50 2.26	25.4×40 2.25	30×30 2.20	35×25 2.25	
680	22×40 2.27	25.4×30 2.23	30×25 2.29			22×45 2.38	25.4×40 2.48	30×30 2.43	35×25 2.48			25.4×45 2.60	30×35 2.56	35×30 2.62	
820	22×45 2.61	25.4×35 2.59	30×30 2.67	35×25 2.73		22×50 2.73	25.4×45 2.85	30×35 2.81	35×30 2.88			25.4×45 2.82	30×40 2.95	35×30 2.88	
1000	22×50 3.01	25.4×40 3.01	30×30 2.95	35×25 3.01				30×40 3.26	35×30 3.18				30×45 3.40	35×35 3.35	
1200		25.4×45 3.23	30×35 3.18	35×30 3.26				30×45 3.49	35×35 3.43					35×40 3.59	40×40 3.81
1500			30×40 3.73	35×35 3.83				30×50 4.06	35×40 4.01					35×50 4.35	40×50 4.60
1800				35×40 4.39	40×40 4.66				35×45 4.58	40×40 4.66					40×60 5.39

WV / ØD / μF	315					350					400				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
68											22×20 0.56	25.4×20 0.61			
82						22×20 0.62					22×25 0.66	25.4×20 0.68			
100	22×20 0.68					22×25 0.73	25.4×20 0.75				22×25 0.74	25.4×25 0.81	30×20 0.82		
120	22×25 0.80	25.4×20 0.82				22×25 0.81	25.4×25 0.88	30×20 0.90			22×30 0.86	25.4×25 0.88	30×20 0.90		
150	22×25 0.89	25.4×25 0.99	30×20 1.01			22×30 0.96	25.4×25 0.97	30×20 1.01			22×30 0.96	25.4×30 1.05	30×25 1.08		
180	22×30 1.05	25.4×25 1.07	30×20 1.10			22×35 1.12	25.4×30 1.14	30×25 1.18			22×40 1.17	25.4×35 1.21	30×25 1.18	35×25 1.28	
220	22×35 1.23	25.4×30 1.27	30×25 1.30			22×40 1.29	25.4×30 1.26	30×25 1.30	35×25 1.41		22×45 1.35	25.4×40 1.41	30×30 1.38	35×25 1.41	
270	22×40 1.43	25.4×30 1.40	30×25 1.44	35×25 1.56			25.4×35 1.47	30×30 1.53	35×25 1.65			25.4×40 1.55	30×30 1.55	35×25 1.56	
330	22×50 1.73	25.4×35 1.63	30×30 1.69	35×25 1.73			25.4×40 1.71	30×35 1.78	35×30 1.83			25.4×45 1.80	30×35 1.78	35×30 1.83	
390		25.4×40 1.86	30×35 1.94	35×30 1.99				30×40 2.03	35×30 1.98				30×40 2.03	35×30 1.98	
470			30×35 2.13	35×30 2.18				30×40 2.23	35×35 2.30				30×45 2.30	35×35 2.30	
560			30×40 2.44	35×35 2.50				30×45 2.55	35×40 2.62					35×40 2.62	40×40 2.78
680			30×45 2.80	35×40 2.88				30×50 2.92	35×45 3.01	40×40 3.06				35×50 3.13	40×50 3.31
820			30×50 3.21	35×50 3.44	40×40 3.37				35×50 3.44	40×50 3.63					40×60 3.89

WV / ØD / μF	450					500					550				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
47											22×30 0.41	25.4×25 0.42	30×20 0.43		
56	22×20 0.51										22×30 0.45	25.4×30 0.49	30×25 0.50		
68	22×25 0.60	25.4×20 0.61				22×25 0.64					22×35 0.52	25.4×30 0.53	30×25 0.55		
82	22×30 0.71	25.4×25 0.72	30×20 0.74			22×30 0.76	25.4×25 0.77				22×40 0.60	25.4×35 0.62	30×30 0.64	35×25 0.66	
100	22×30 0.78	25.4×30 0.85	30×25 0.88			22×40 0.92	25.4×30 0.92	30×25 0.94			22×45 0.70	25.4×40 0.72	30×30 0.71	35×25 0.73	
120	22×35 0.91	25.4×30 0.93	30×25 0.96				25.4×40 1.09	30×30 1.09				25.4×45 0.83	30×35 0.82	35×30 0.84	
150	22×40 1.07	25.4×35 1.10	30×30 1.14	35×25 1.16				30×30 1.10				25.4×50 0.96	30×40 0.96	35×35 0.99	
180		25.4×35 1.20	30×30 1.25	35×25 1.28				30×35 1.26					30×45 1.10	35×35 1.08	
220		25.4×40 1.40	30×35 1.45	35×30 1.49				30×40 1.46	35×30 1.75					35×45 1.31	40×40 1.33
270			30×40 1.62	35×30 1.65					35×35 1.83					35×50 1.51	40×50 1.59
330			30×45 1.94	35×35 1.94					35×40 1.94						40×50 1.76
390			30×50 2.21	35×35 2.09					35×45 2.16						40×60 2.05
470			30×50 2.42	35×40 2.42	40×40 2.55				35×50 2.23	40×50 2.94					40×60 2.25
560				35×50 2.84	40×50 3.00					40×60 3.43					
680					40×60 3.54					40×60 3.78	← Case size ØD×L (mm) ← Ripple current (Arms) at 85°C, 120Hz				

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HJ Snap-in Terminal Type, Series

Solvent Proof
WV≦100V

· High voltage, high capacitance series
· Load life of 3000 hours at 85°C
· Complied to the RoHS directive

HC (Long life) ⇨ **HJ** ⇨ HK (Wide temp.)



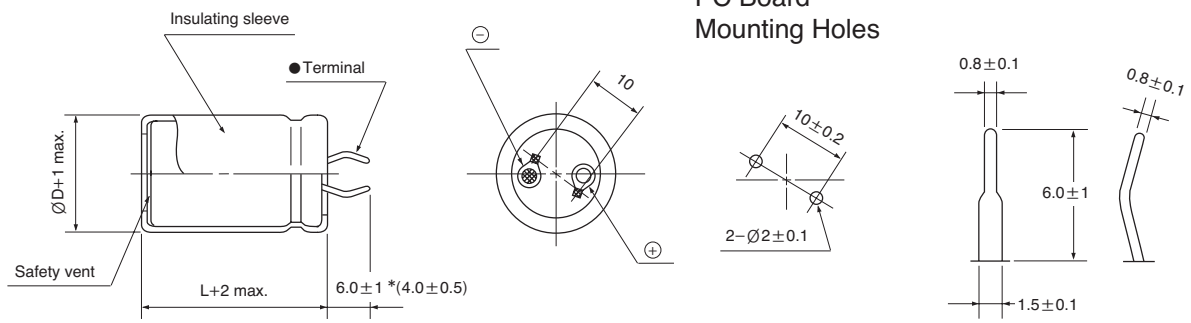
Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +85°C, WV≧350 : -25 ~ +85°C
Capacitance tolerance	±20% at 120Hz, 20°C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

WV	10	16, 25	35	50, 63	80, 100	160 ~ 400	450, 500
tanδ	0.40	0.35	0.30	0.25	0.20	0.15	0.20

Load life (after application of the rated voltage for 3000 hours at 85°C)		
	Leakage current	Less than specified value
	Capacitance change	Within ±20% of initial value
	tanδ	Less than 200% of specified value
Shelf life (at 85°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4	

DRAWING

Unit : mm



∗ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

HJ series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	10				16				25			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
6800									22×25 2.24			
8200									22×30 2.61			
10000					22×30 2.68				22×35 3.24	25.4×30 3.14	30×25 3.25	
12000	22×25 2.39				22×35 3.12	25.4×25 3.00			22×40 3.70	25.4×35 3.63	30×25 3.56	
15000	22×30 2.86				22×40 3.67	25.4×30 3.58	30×25 3.70			25.4×40 4.09	30×30 4.00	35×25 4.07
18000	22×35 3.21	25.4×25 3.05			22×45 4.15	25.4×35 4.13	30×25 3.93			25.4×45 4.62	30×35 4.60	35×30 4.64
22000	22×40 3.74	25.4×30 3.64				25.4×40 4.44	30×30 4.38			25.4×50 5.14	30×40 5.17	35×30 5.05
27000	22×45 4.06	25.4×35 3.98	30×25 3.57			25.4×45 4.89	30×35 4.84	35×25 4.71			30×45 5.98	35×35 5.88
33000		25.4×40 4.50	30×30 3.99	35×25 4.57			30×40 5.50	35×30 5.41				35×40 6.59
39000		25.4×45 5.17	30×30 4.55	35×30 5.18			30×45 6.19	35×35 6.09				
47000			30×35 5.15	35×35 5.76			30×50 6.80	35×40 6.75				
56000			30×40 5.61	35×40 6.45								

WV / ØD / μF	35				50				63			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
2200									22×30 2.15			
2700					22×25 1.95				22×30 2.38	25.4×25 2.42		
3300					22×30 2.40	25.4×25 2.35			22×35 2.72	25.4×30 2.74		
3900	22×25 1.89				22×30 2.50	25.4×25 2.50			22×40 3.07	25.4×35 3.16	30×25 3.00	
4700	22×30 2.29	25.4×25 2.26			22×35 2.91	25.4×30 2.98	30×25 3.01		22×45 3.44	25.4×40 3.55	30×30 3.51	
5600	22×30 2.42	25.4×25 2.42			22×40 3.31	25.4×35 3.44	30×30 3.42		22×50 3.92	25.4×45 4.01	30×35 3.98	35×30 3.93
6800	22×35 2.82	25.4×30 2.89	30×25 2.89		22×45 3.70	25.4×40 3.81	30×35 3.93	35×25 3.80		25.4×50 4.47	30×40 4.48	35×30 4.38
8200	22×40 3.26	25.4×35 3.30	30×25 3.19			25.4×45 4.32	30×40 4.51	35×30 4.41			30×45 5.07	35×35 4.99
10000	22×45 3.57	25.4×40 3.65	30×30 3.60	35×25 3.60		25.4×50 4.83	30×45 5.04	35×35 4.88			30×50 5.75	35×40 5.68
12000		25.4×45 4.15	30×35 4.13	35×30 4.23			30×45 5.44	35×40 5.60				35×45 6.47
15000		25.4×50 4.76	30×40 4.76	35×35 4.90				35×45 6.53				
18000			30×45 5.22	35×40 5.44				35×45 7.04				
22000				35×45 6.28								
27000				35×50 6.90								

WV / ØD / μF	80				100			
	22	25.4	30	35	22	25.4	30	35
1200	22×25 1.77				22×30 2.02	25.4×25 2.06		
1500	22×30 2.00	25.4×25 2.02			22×35 2.40	25.4×30 2.45		
1800	22×35 2.35	25.4×30 2.35			22×40 2.76	25.4×35 2.81	30×30 2.84	
2200	22×40 2.86	25.4×30 2.79	30×25 2.85		22×45 3.00	25.4×40 3.10	30×30 3.06	35×25 3.13
2700	22×45 3.23	25.4×35 3.05	30×30 3.17			25.4×45 3.59	30×35 3.57	35×30 3.66
3300	22×50 3.18	25.4×40 3.28	30×30 3.24				30×40 4.15	35×35 4.18
3900		25.4×45 3.62	30×35 3.60				30×45 4.58	35×35 4.51
4700		25.4×50 4.22	30×40 4.23	35×30 4.12				35×40 5.18
5600			30×45 4.66	35×35 4.59				35×50 5.91
6800				35×40 5.20				
8200				35×45 5.86				
10000				35×50 6.61				

Case size ØD×L (mm)
Ripple current (A rms) at 85°C, 120Hz

HJ series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
220					22×20 1.18				22×25 1.24	25.4×20 1.22		
270	22×20 1.30				22×25 1.37	25.4×20 1.35			22×25 1.50	25.4×25 1.32		
330	22×25 1.50				22×25 1.51	25.4×20 1.49			22×30 1.66	25.4×25 1.61	30×20 1.58	
390	22×25 1.63	25.4×20 1.62			22×25 1.73	25.4×25 1.71	30×20 1.71		22×35 1.88	25.4×30 1.88	30×25 1.86	
470	22×30 1.86	25.4×20 1.86			22×30 1.97	25.4×25 1.95	30×20 1.88		22×35 2.15	25.4×35 2.15	30×25 2.04	
560	22×30 2.15	25.4×25 2.15	30×20 2.05		22×35 2.18	25.4×30 2.15	30×25 2.15		22×40 2.48	25.4×35 2.35	30×25 2.35	35×25 2.35
680	22×35 2.35	25.4×30 2.33	30×25 2.33		22×40 2.48	25.4×30 2.48	30×25 2.48	35×25 2.33	22×50 2.61	25.4×40 2.67	30×30 2.71	35×25 2.58
820	22×40 2.68	25.4×30 2.65	30×25 2.64		22×45 2.81	25.4×35 2.79	30×30 2.80	35×25 2.83		25.4×45 3.01	30×35 2.98	35×30 2.96
1000	22×45 3.02	25.4×35 3.00	30×30 2.96	35×25 3.13	22×50 3.28	25.4×40 3.28	30×35 3.15	35×30 3.26			30×40 3.56	35×35 3.48
1200	22×50 3.47	25.4×40 3.43	30×30 3.41	35×25 3.40		25.4×45 3.61	30×35 3.61	35×30 3.57			30×45 3.99	35×35 3.84
1500		25.4×45 3.96	30×35 3.96	35×30 3.94			30×45 4.13	35×35 4.06			30×50 4.33	35×40 4.33
1800			30×40 4.31	35×35 4.28			30×50 4.60	35×40 4.59				35×50 4.76
2200			30×50 4.96	35×40 4.96				35×45 5.25				

WV / ØD / μF	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
68					22×20 0.65				22×20 0.71			
82					22×20 0.85				22×25 0.86	25.4×20 0.84		
100	22×20 0.80				22×25 0.99	25.4×20 0.82			22×25 0.95	25.4×25 0.97		
120	22×25 1.04	25.4×20 1.05			22×25 1.09	25.4×20 1.13			22×30 1.07	25.4×25 1.09	30×20 1.12	
150	22×25 1.20	25.4×25 1.22			22×30 1.24	25.4×25 1.27	30×20 1.20		22×35 1.18	25.4×30 1.25	30×25 1.29	
180	22×30 1.34	25.4×25 1.37			22×30 1.41	25.4×25 1.44	30×25 1.52		22×35 1.32	25.4×35 1.40	30×25 1.45	
220	22×30 1.47	25.4×30 1.53	30×25 1.54		22×35 1.58	25.4×30 1.64	30×25 1.66		22×40 1.48	25.4×35 1.59	30×25 1.64	35×25 1.59
270	22×35 1.70	25.4×30 1.73	30×25 1.80		22×40 1.65	25.4×35 1.79	30×30 1.82	35×25 1.63	22×50 1.88	25.4×40 1.87	30×30 1.89	35×25 1.90
330	22×45 1.87	25.4×35 1.97	30×30 2.03	35×25 1.80	22×50 1.95	25.4×40 2.00	30×30 2.05	35×25 2.05		25.4×45 2.12	30×35 2.12	35×30 2.15
390	22×50 2.08	25.4×40 2.14	30×30 2.23	35×25 2.30		25.4×45 2.12	30×35 2.26	35×30 2.28			30×40 2.30	35×35 2.35
470		25.4×45 2.55	30×35 2.53	35×30 2.55		25.4×50 2.46	30×40 2.51	35×30 2.51			30×45 2.68	35×35 2.68
560		25.4×50 2.70	30×40 2.73	35×35 2.75			30×45 2.85	35×35 2.85				35×40 2.88
680			30×45 3.15	35×35 3.15			30×50 3.01	35×40 3.01				35×50 3.44
820				35×40 3.47	← Case size ØD×L (mm) ← Ripple current (Arms) at 85°C, 120Hz							

WV / ØD / μF	500			
	22	25.4	30	35
56	22×20 0.50			
68	22×25 0.59	25.4×20 0.59		
82	22×30 0.68	25.4×25 0.65		
100	22×35 0.79	25.4×30 0.82	30×25 0.82	
120	22×40 0.94	25.4×35 0.94	30×25 0.95	
150	22×45 1.09	25.4×35 1.10	30×30 1.13	
180	22×50 1.27	25.4×40 1.30	30×35 1.30	35×25 1.27
220		25.4×45 1.50	30×40 1.50	35×30 1.48
270			30×45 1.81	35×35 1.72
330				35×40 1.99
390				35×45 2.34
470				35×50 2.81

HF Snap-in Terminal Type, Long life Series

· Long life than HJ series
· Load life at 5000 hours at 85°C
· Complied to the RoHS directive

HJ ⇨ **HF**
Long life

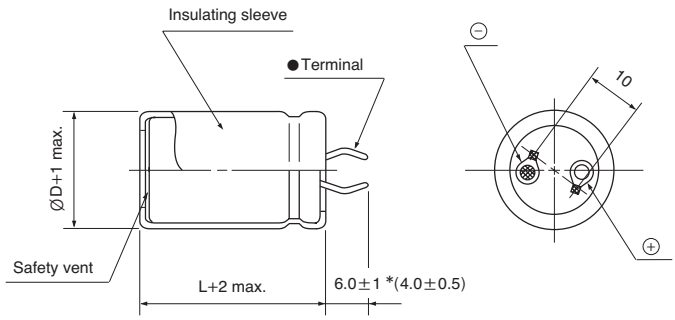


Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +85°C, WV≧350 : -25 ~ +85°C
Capacitance tolerance	±20% at 120Hz, 20°C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.
Load life (after application of the rated voltage for 5000 hours at 85°C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life (at 85°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4

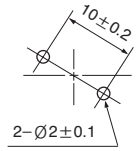
WV	160	200	250	350	400	450
tanδ	0.15	0.15	0.15	0.15	0.15	0.20

DRAWING

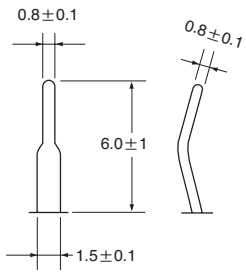
Unit : mm



PC Board Mounting Holes



● Terminal



* Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

HF series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
150									22×20 0.97			
180					22×20 0.91				22×20 1.06			
220					22×20 1.18				22×25 1.24	25.4×20 1.22		
270	22×20 1.30				22×25 1.37	25.4×20 1.35			22×25 1.50	25.4×25 1.32		
330	22×25 1.50				22×25 1.51	25.4×20 1.49			22×30 1.66	25.4×25 1.61	30×20 1.58	
390	22×25 1.63	25.4×20 1.62			22×25 1.73	25.4×25 1.71	30×20 1.71		22×35 1.88	25.4×30 1.88	30×25 1.86	
470	22×30 1.86	25.4×20 1.86			22×30 1.97	25.4×25 1.95	30×20 1.88		22×35 2.15	25.4×35 2.15	30×25 2.04	
560	22×30 2.15	25.4×25 2.15	30×20 2.05		22×35 2.18	25.4×30 2.15	30×25 2.15		22×40 2.48	25.4×35 2.35	30×25 2.35	35×25 2.35
680	22×35 2.35	25.4×30 2.33	30×25 2.33		22×40 2.48	25.4×30 2.48	30×25 2.48	35×25 2.33	22×50 2.61	25.4×40 2.67	30×30 2.71	35×25 2.58
820	22×40 2.68	25.4×30 2.65	30×25 2.64		22×45 2.81	25.4×35 2.79	30×30 2.80	35×25 2.83		25.4×45 3.01	30×35 2.98	35×30 2.96
1000	22×45 3.02	25.4×35 3.00	30×30 2.96	35×25 3.13	22×50 3.28	25.4×40 3.28	30×35 3.15	35×30 3.26			30×40 3.56	35×35 3.48
1200	22×50 3.47	25.4×40 3.43	30×30 3.41	35×25 3.40		25.4×45 3.61	30×35 3.61	35×30 3.57			30×45 3.99	35×35 3.84
1500		25.4×45 3.96	30×35 3.96	35×30 3.94			30×45 4.13	35×35 4.06			30×50 4.33	35×40 4.33
1800			30×40 4.31	35×35 4.28			30×50 4.60	35×40 4.59				35×50 4.76
2200			30×50 4.96	35×40 4.96				35×45 5.25				
2700				35×45 5.57								
3300				35×50 6.21								

WV / ØD / μF	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
56									22×20 0.61			
68					22×20 0.65				22×20 0.71			
82					22×20 0.85				22×25 0.86	25.4×20 0.84		
100	22×20 0.80				22×25 0.99	25.4×20 0.82			22×25 0.95	25.4×25 0.97		
120	22×25 1.04	25.4×20 0.90			22×25 1.09	25.4×20 1.13			22×30 1.07	25.4×25 1.09	30×20 1.12	
150	22×25 1.20	25.4×25 1.22			22×30 1.24	25.4×25 1.27	30×20 1.20		22×35 1.18	25.4×30 1.25	30×25 1.29	
180	22×30 1.34	25.4×25 1.37			22×30 1.41	25.4×25 1.44	30×25 1.52		22×35 1.32	25.4×35 1.40	30×25 1.45	
220	22×30 1.47	25.4×30 1.53	30×25 1.54		22×35 1.58	25.4×30 1.64	30×25 1.66		22×40 1.48	25.4×35 1.59	30×25 1.64	35×25 1.59
270	22×35 1.70	25.4×30 1.73	30×25 1.80		22×40 1.65	25.4×35 1.79	30×30 1.82	35×25 1.63	22×50 1.88	25.4×40 1.87	30×30 1.89	35×25 1.90
330	22×45 1.87	25.4×35 1.97	30×30 2.03	35×25 1.80	22×50 1.95	25.4×40 2.00	30×30 2.05	35×25 2.05		25.4×45 2.12	30×35 2.12	35×30 2.15
390	22×50 2.08	25.4×40 2.14	30×30 2.23	35×25 2.30		25.4×45 2.12	30×35 2.26	35×30 2.28			30×40 2.23	35×35 2.29
470		25.4×45 2.55	30×35 2.53	35×30 2.55		25.4×50 2.46	30×40 2.51	35×30 2.51			30×45 2.68	35×35 2.68
560		25.4×50 2.64	30×40 2.73	35×35 2.75			30×45 2.85	35×35 2.85				35×40 2.88
680			30×45 3.15	35×35 3.15			30×50 3.01	35×40 3.01				35×50 3.44
820				35×40 3.47				35×50 3.31	← Case size ØD×L (mm) ← Ripple current (Arms) at 85°C, 120Hz			
1000				35×45 3.65								

JR Snap-in Terminal Type, Long Life Series

· Long life than HF series
· Load life of 10000 hours at 85˚C
· Complied to the RoHS directive

HF ⇨ JR
Long life



Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (120Hz, 20˚C)	WV: 400 / 450; tanδ: 0.15 / 0.20
Load life (after application of the rated voltage for 10000 hours at 85˚C)	Leakage current: Less than specified value; Capacitance change: Within ±20% of initial value; tanδ: Less than 200% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 183)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	400				450			
	22	25.4	30	35	22	25.4	30	35
56	22×20 0.68				22×25 0.70	25.4×20 0.71		
68	22×20 0.75	25.4×20 0.74			22×25 0.82	25.4×25 0.84	30×20 0.97	
82	22×25 0.98	25.4×25 0.82	30×20 0.97		22×30 0.99	25.4×25 0.97	30×20 1.09	
100	22×25 1.14	25.4×25 0.94	30×20 1.09		22×30 1.09	25.4×25 1.12	30×25 1.12	
120	22×30 1.25	25.4×30 1.30	30×25 1.21		22×35 1.23	25.4×30 1.25	30×25 1.29	35×20 1.28
150	22×35 1.43	25.4×30 1.46	30×25 1.38		22×45 1.36	25.4×30 1.44	30×25 1.48	35×25 1.40
180	22×40 1.62	25.4×40 1.66	30×30 1.75	35×25 1.51		25.4×35 1.61	30×30 1.67	35×25 1.54
220	22×45 1.82	25.4×40 1.89	30×30 1.91	35×30 1.63		25.4×40 1.83	30×30 1.89	35×30 1.68
270		25.4×45 2.06	30×35 2.09	35×30 1.87			30×35 2.17	35×30 1.83
330		25.4×50 2.30	30×40 2.36	35×35 2.36			30×40 2.44	35×35 2.19
390		25.4×60 2.44	30×50 2.60	35×40 2.62			30×50 2.56	35×40 2.47
470			30×50 2.89	35×40 2.89				35×40 2.63
560				35×45 3.28				35×45 3.31
680				35×50 3.46	← Case size ØD×L (mm) ← Ripple current (A rms) at 85˚C, 120Hz			

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
400, 450	0.85	1.00	1.15	1.20	1.40

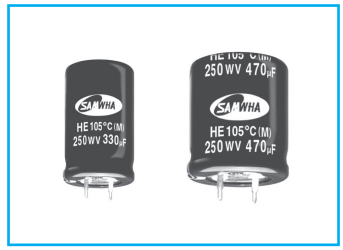
LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HE Wide Temperature Range, Standard Series

Solvent Proof
WV≦100V

- Wide temperature range of -40(-25) ~ +105˚C
- Standard snap-in terminal type
- Complied to the RoHS directive

HC (Wide temp.) ⇨ HE ⇨ HK (Long life)



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105˚C, WV ≧ 350 : -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

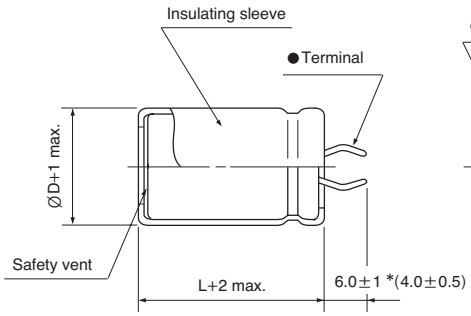
WV	6.3, 10	16	25, 35	50, 63	80, 100	160~400	450~600
tanδ	0.50	0.40	0.35	0.25	0.20	0.15	0.20

Load life (after application of the rated voltage for 2000 hours at 105˚C)		
	Leakage current	Less than specified value
	Capacitance change	Within ±20% of initial value
	tanδ	Less than 200% of specified value (600Vdc : ≤300%)
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4	

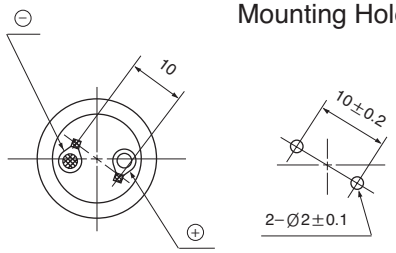
DRAWING

Unit : mm

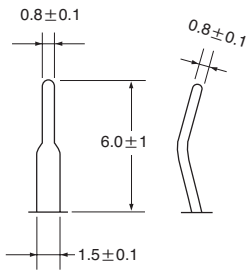
ØD≦40



PC Board Mounting Holes

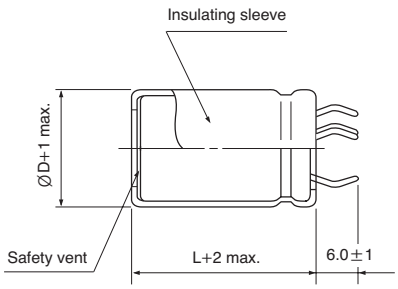


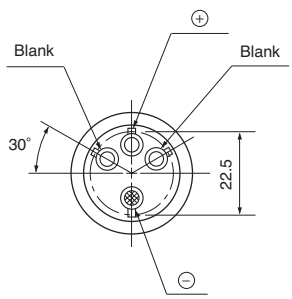
Terminal



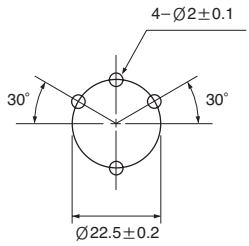
∗ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

ØD=35, 40





PC Board Mounting Holes



FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency(Hz)	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
315 ~	0.85	1.00	1.15	1.20	1.40

HE series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	6.3					10					16				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
8200											22×25 2.14				
10000						22×25 2.17					22×30 2.48	25.4×25 2.56			
12000	22×25 2.19					22×30 2.48					22×35 2.80	25.4×30 2.90	30×25 2.97		
15000	22×30 2.53					22×35 2.83	25.4×25 2.75				22×40 3.17	25.4×35 3.29	30×30 3.38		
18000	22×35 2.85	25.4×25 2.77				22×35 3.00	25.4×30 3.11				22×45 3.50	25.4×40 3.65	30×30 3.57		
22000	22×35 3.04	25.4×30 3.15				22×40 3.35	25.4×35 3.48	30×25 3.38				25.4×45 4.03	30×35 3.98		
27000	22×40 3.40	25.4×35 3.53	30×25 3.42			22×50 3.88	25.4×40 3.87	30×30 3.79				25.4×50 4.42	30×40 4.39	35×30 4.29	
33000	22×50 3.92	25.4×40 3.91	30×30 3.83				25.4×45 4.26	30×35 4.20					30×45 4.79	35×35 4.71	
39000		25.4×45 4.26	30×35 4.20				25.4×50 4.60	30×40 4.57	35×30 4.46				30×50 5.16	35×40 5.10	
47000		25.4×50 4.63	30×40 4.60	35×30 4.50				30×45 4.95	35×35 4.87					35×45 5.50	40×40 5.60
56000			30×50 5.17	35×40 5.12					35×45 5.49	40×40 5.59					40×50 6.22
68000				35×45 5.52	40×40 5.62					40×50 6.22					40×60 6.83

WV / ØD / μF	25					35					50				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
2700											22×30 1.94				
3300						22×25 1.62					22×35 2.20				
3900						22×30 1.88					22×40 2.52	25.4×35 2.62	30×25 2.54		
4700	22×25 1.73					22×35 2.14	25.4×25 2.09				22×45 2.81	25.4×40 2.93	30×30 2.87		
5600	22×30 1.98					22×35 2.29	25.4×30 2.37	30×25 2.43			22×50 3.11	25.4×40 3.11	30×35 3.21		
6800	22×30 2.14					22×40 2.61	25.4×35 2.71	30×30 2.79				25.4×50 3.64	30×40 3.61	35×30 3.53	
8200	22×35 2.42	25.4×30 2.50				22×50 3.02	25.4×40 3.02	30×30 2.95					30×45 3.94	35×35 3.87	
10000	22×40 2.77	25.4×35 2.88					25.4×45 3.43	30×35 3.38					30×50 4.42	35×40 4.37	
12000	22×45 3.09	25.4×40 3.22	30×30 3.15				25.4×50 3.78	30×40 3.75	35×30 3.67					35×45 4.78	
15000		25.4×45 3.62	30×35 3.57	35×30 3.65				30×45 4.19	35×35 4.12					35×50 5.24	40×40 5.13
18000		25.4×50 3.98	30×40 3.95	35×35 4.06					35×40 4.52						40×50 5.76
22000			30×45 4.36	35×35 4.28					35×45 4.95	40×40 5.04					40×50 5.98
27000				35×45 4.92	40×40 5.01					40×50 5.92					40×60 6.61

WV / ØD / μF	63					80					100				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
820						22×25 1.37					22×30 1.46	25.4×25 1.51			
1000						22×30 1.62	25.4×25 1.67				22×35 1.71	25.4×30 1.77			
1200	22×25 1.37					22×30 1.67	25.4×25 1.72				22×40 1.86	25.4×35 1.94	30×25 1.88		
1500	22×30 1.50	25.4×25 1.54				22×35 1.98	25.4×30 2.05				22×45 2.18	25.4×40 2.28	30×30 2.23		
1800	22×30 1.64	25.4×25 1.69				22×40 2.28	25.4×35 2.37	30×25 2.30				25.4×45 2.61	30×35 2.57		
2200	22×35 1.86	25.4×30 1.92				22×45 2.51	25.4×35 2.49	30×30 2.56				25.4×50 2.85	30×40 2.83	35×30 2.76	
2700	22×40 2.17	25.4×30 2.13	30×25 2.18				25.4×45 3.03	30×35 2.99					30×45 3.27	35×35 3.22	
3300	22×50 2.53	25.4×40 2.53	30×30 2.48				25.4×50 3.33	30×40 3.30	35×30 3.23				30×50 3.59	35×40 3.55	
3900		25.4×45 2.88	30×35 2.84					30×45 3.75	35×35 3.69					35×45 4.03	
4700		25.4×50 3.20	30×40 3.17	35×30 3.10				30×50 4.10	35×40 4.06					35×50 4.40	40×40 4.31
5600			30×45 3.51	35×35 3.46					35×45 4.44						40×50 4.88
6800			30×50 3.92	35×40 3.88					35×50 4.90	40×40 4.80					40×50 5.18
8200				35×45 4.22						40×50 5.32	← Case size ØD×L (mm) ← Ripple current (Arms) at 105°C, 120Hz				
10000				35×50 4.74	40×40 4.64										

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HE series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160					200					250				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
150						22×20 0.63					22×20 0.68	25.4×20 0.69			
180	22×20 0.69					22×20 0.69					22×25 0.74	25.4×20 0.76	30×20 0.83		
220	22×20 0.76					22×25 0.82	25.4×20 0.84				22×25 0.88	25.4×25 0.90	30×20 0.92		
270	22×25 0.91	25.4×20 0.93				22×25 0.91	25.4×25 1.00	30×20 1.02			22×30 1.03	25.4×25 1.06	30×25 1.09		
330	22×25 1.01	25.4×25 1.10	30×20 1.13			22×30 1.07	25.4×25 1.11	30×20 1.13			22×35 1.20	25.4×30 1.18	30×25 1.21		
390	22×30 1.17	25.4×25 1.20	30×20 1.23			22×30 1.24	25.4×30 1.28	30×25 1.31			22×40 1.36	25.4×35 1.42	30×25 1.39	35×25 1.42	
470	22×30 1.36	25.4×25 1.32	30×25 1.44			22×35 1.43	25.4×30 1.48	30×25 1.44	35×25 1.56		22×45 1.56	25.4×35 1.56	30×30 1.53	35×25 1.56	
560	22×35 1.56	25.4×30 1.53	30×25 1.57	35×25 1.70		22×45 1.63	25.4×35 1.62	30×30 1.67	35×25 1.70			25.4×40 1.86	30×30 1.76	35×30 1.80	
680	22×40 1.80	25.4×35 1.79	30×25 1.73	35×25 1.88		22×50 1.88	25.4×40 1.96	30×30 1.84	35×25 1.88				30×35 2.12	35×35 2.09	
820		25.4×40 2.06	30×30 2.02	35×25 2.06			25.4×45 2.25	30×35 2.13	35×30 2.18				30×40 2.23	35×35 2.40	
1000		25.4×40 2.38	30×35 2.35	35×30 2.41				30×40 2.57	35×35 2.53					35×40 2.76	40×40 2.81
1200		25.4×50 2.52	30×40 2.50	35×30 2.44				30×50 2.72	35×35 2.57	40×40 2.85				35×45 2.91	40×50 3.08
1500				35×40 3.00	40×40 3.19				35×45 3.13	40×50 3.44					40×60 3.68

WV / ØD / μF	315					350					400				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
56											22×20 0.37				
68						22×20 0.41					22×20 0.44	25.4×20 0.45			
82	22×20 0.45					22×25 0.48	25.4×20 0.49				22×25 0.48	25.4×25 0.53	30×20 0.54		
100	22×25 0.53	25.4×20 0.55				22×25 0.53	25.4×25 0.59	30×20 0.60			22×25 0.56	25.4×25 0.58	30×20 0.60		
120	22×30 0.62	25.4×25 0.64	30×20 0.65			22×30 0.62	25.4×25 0.64	30×20 0.65			22×30 0.66	25.4×30 0.68	30×25 0.70		
150	22×30 0.74	25.4×25 0.76	30×20 0.73			22×35 0.78	25.4×30 0.76	30×25 0.78			22×35 0.77	25.4×30 0.75	30×25 0.78		
180	22×35 0.85	25.4×30 0.88	30×25 0.86			22×40 0.89	25.4×35 0.88	30×30 0.91			22×40 0.89	25.4×40 0.93	30×30 0.91	35×25 0.93	
220	22×40 0.98	25.4×35 0.98	30×25 0.98			22×50 1.03	25.4×40 1.03	30×30 1.00	35×25 1.03		22×45 1.02	25.4×40 1.01	30×30 1.00	35×30 1.08	
270		25.4×40 1.19	30×30 1.12	35×25 1.14			25.4×45 1.19	30×35 1.17	35×30 1.20			25.4×45 1.17	30×35 1.17	35×30 1.20	
330		25.4×40 1.24	30×35 1.36	35×30 1.33			25.4×50 1.35	30×40 1.36	35×30 1.36			25.4×50 1.35	30×40 1.36	35×35 1.40	
390			30×35 1.47	35×30 1.52			25.4×50 1.47	30×40 1.54	35×35 1.54			25.4×60 1.54	30×50 1.61	35×40 1.59	
470			30×40 1.70	35×35 1.74					35×40 1.74				30×50 1.76	35×40 1.82	40×40 1.85
560			30×45 1.90	35×40 1.90					35×45 2.06	40×40 2.02				35×45 2.06	40×50 2.18
680			30×50 2.12	35×45 2.18	40×40 2.23					40×50 2.40				35×50 2.27	40×60 2.57

WV / ØD / μF	450				500				550				600	
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35	30	35
47	22×20 0.34				22×25 0.32	25.4×20 0.32			22×25 0.35					
56	22×25 0.40	25.4×20 0.41			22×30 0.37	25.4×25 0.38	30×20 0.40		22×30 0.41	25.4×25 0.42				
68	22×25 0.44	25.4×25 0.48	30×20 0.49		22×30 0.50	25.4×25 0.42	30×25 0.47		22×35 0.48	25.4×30 0.49	30×25 0.51			
82	22×30 0.51	25.4×25 0.52	30×20 0.54		22×35 0.53	25.4×30 0.61	30×25 0.52		22×40 0.55	25.4×35 0.57	30×25 0.56			
100	22×30 0.56	25.4×25 0.58	30×25 0.64		22×35 0.55	25.4×35 0.70	30×25 0.56	35×25 0.61	22×45 0.64	25.4×40 0.66	30×30 0.66	35×25 0.67		
120	22×35 0.66	25.4×30 0.67	30×25 0.70	35×20 0.76	22×40 0.66	25.4×35 0.71	30×30 0.80	35×30 0.71	22×50 0.73	25.4×40 0.72	30×35 0.75	35×30 0.75	30×40 0.96	35×30 0.95
150	22×45 0.80	25.4×30 0.77	30×25 0.83	35×25 0.85		25.4×40 0.81	30×30 0.82	35×30 0.79		25.4×50 0.88	30×40 0.88	35×30 0.88	30×45 1.10	35×35 1.07
180		25.4×35 0.93	30×30 0.90	35×25 0.98		25.4×45 0.86	30×40 1.02	35×30 1.05			30×45 1.00	35×35 1.01	30×50 1.22	35×40 1.22
220		25.4×40 1.08	30×30 1.06	35×30 1.08			30×40 1.12	35×35 1.08			30×50 1.15	35×40 1.15	30×60 1.40	35×45 1.38
270			30×35 1.23	35×30 1.26			30×50 1.18	35×40 1.24				35×45 1.32		35×50 1.56
330			30×40 1.42	35×35 1.46				35×45 1.42				35×50 1.58		35×60 1.79
390			30×50 1.60	35×40 1.66				35×50 1.62				35×60 1.78		
470				35×40 1.81				35×55 1.71						
560				35×45 2.06	← Case size ØD×L (mm) ← Ripple current (Arms) at 105°C, 120Hz									

JK For Printer system

· For printer system
· No sparks DC overvoltage



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105°C, WV≧350 : -25 ~ +105°C
Capacitance tolerance	±20% at 120Hz, 20°C
Leakage current max.	$I=3\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (120Hz, 20°C)	WV: 250, 400: 450 / tanδ: 0.15: 0.20
Load life (after application of the rated voltage for 2000 hours at 105°C)	Leakage current: Less than specified value / Capacitance change: Within ±20% of initial value / tanδ: Less than 200% of specified value
Shelf life (at 105°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4

● DRAWING (See page 183)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	250			400			450		
	25.4	30	35	25.4	30	35	25.4	30	35
82				25.4×25 0.53	30×20 0.54		25.4×25 0.53	30×20 0.54	
100				25.4×30 0.62	30×20 0.60		25.4×25 0.58	30×25 0.64	
120				25.4×30 0.68	30×25 0.70		25.4×30 0.67	30×25 0.74	
150	25.4×20 0.69			25.4×35 0.81	30×30 0.83		25.4×35 0.85	30×30 0.88	35×25 0.85
180	25.4×20 0.76	30×20 0.83		25.4×40 0.93	30×30 0.91	35×25 0.93	25.4×40 0.97	30×30 0.96	35×30 0.98
220	25.4×25 0.90	30×20 0.92		25.4×45 1.07	30×35 1.05	35×30 1.08	25.4×50 1.32	30×30 1.40	35×30 1.43
270	25.4×30 1.06	30×25 1.09		25.4×50 1.24	30×40 1.23	35×30 1.20		30×35 1.43	35×35 1.45
330	25.4×30 1.18	30×25 1.21			30×45 1.42	35×35 1.40		30×45 1.48	35×35 1.49
390	25.4×35 1.42	30×30 1.39	35×25 1.42		30×50 1.61	35×40 1.59			35×40 1.59
470	25.4×35 1.48	30×30 1.53	35×25 1.56			35×45 1.82			35×50 1.89
560	25.4×40 1.65	30×30 1.67	35×25 1.72			35×50 2.06			
680		30×35 2.12	35×35 2.09						
820		30×40 2.23	35×40 2.40						
1000			35×45 2.76						
1200			35×45 2.91						
1500			35×45 3.13	← Case size ØD×L (mm) ← Ripple current (A rms) at 105°C, 120Hz					

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
250	0.85	1.00	1.20	1.25	1.45
400, 450	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

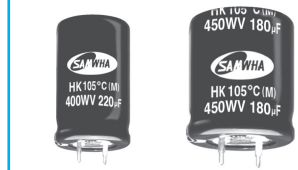
HK Miniaturized Series

- Smaller case sizes than HE series
- Load life of 3000 hours at 105˚C
- Complied to the RoHS directive

Solvent Proof WV≦100V

Miniaturized

HE Long life ⇨ HK ⇨ HL Long life

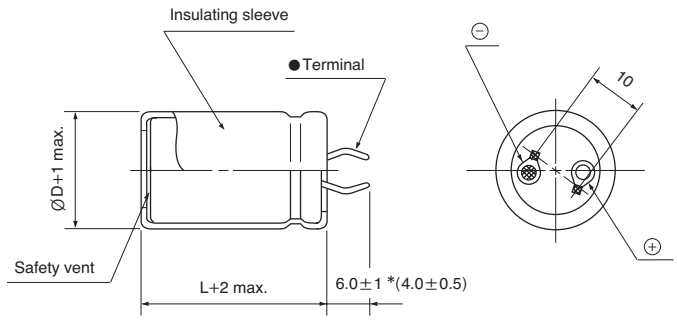


Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105˚C, WV ≧350 : -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.
Load life (after application of the rated voltage for 3000 hours at 105˚C)	Leakage current : Less than specified value Capacitance change : Within ±20% of initial value tanδ : Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

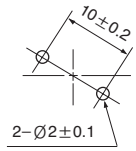
WV	6.3, 10	16	25, 35	50, 63	80, 100	160~400	450, 500
tanδ	0.50	0.40	0.35	0.25	0.20	0.15	0.20

DRAWING

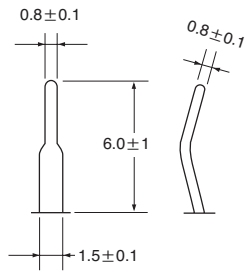
Unit : mm



PC Board Mounting Holes



● Terminal



* Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

HK series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF \ ØD	6.3					10					16				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
8200											22×25 2.14				
10000						22×25 2.17					22×30 2.48	25.4×25 2.56			
12000	22×25 2.19					22×30 2.48					22×35 2.80	25.4×30 2.90	30×25 2.97		
15000	22×30 2.53					22×35 2.83	25.4×25 2.75				22×40 3.17	25.4×35 3.29	30×30 3.38		
18000	22×35 2.85	25.4×25 2.77				22×35 3.00	25.4×30 3.11				22×45 3.50	25.4×40 3.65	30×30 3.57		
22000	22×35 3.04	25.4×30 3.15				22×40 3.35	25.4×35 3.48	30×25 3.38				25.4×45 4.03	30×35 3.98		
27000	22×40 3.40	25.4×35 3.53	30×25 3.42			22×50 3.88	25.4×40 3.87	30×30 3.79				25.4×50 4.42	30×40 4.39	35×30 4.29	
33000	22×50 3.92	25.4×40 3.91	30×30 3.83				25.4×45 4.26	30×35 4.20					30×45 4.79	35×35 4.71	
39000		25.4×45 4.26	30×35 4.20				25.4×50 4.60	30×40 4.57	35×30 4.46				30×50 5.16	35×40 5.10	
47000		25.4×50 4.63	30×40 4.60	35×30 4.50				30×45 4.95	35×35 4.87					35×45 5.50	40×40 5.60
56000			30×50 5.17	35×40 5.12					35×45 5.49	40×40 5.59					40×50 6.22
68000				35×45 5.52	40×40 5.62					40×50 6.22					40×60 6.83

WV / μF \ ØD	25					35					50				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
2700											22×30 1.94				
3300						22×25 1.62					22×35 2.20				
3900						22×30 1.88					22×40 2.52	25.4×35 2.62	30×25 2.54		
4700	22×25 1.73					22×35 2.14	25.4×25 2.09				22×45 2.81	25.4×40 2.93	30×30 2.87		
5600	22×30 1.98					22×35 2.29	25.4×30 2.37	30×25 2.43			22×50 3.11	25.4×40 3.11	30×35 3.21		
6800	22×30 2.14					22×40 2.61	25.4×35 2.71	30×30 2.79				25.4×50 3.64	30×40 3.61	35×30 3.53	
8200	22×35 2.42	25.4×30 2.50				22×50 3.02	25.4×40 3.02	30×30 2.95					30×45 3.94	35×35 3.87	
10000	22×40 2.77	25.4×35 2.88					25.4×45 3.43	30×35 3.38					30×50 4.42	35×40 4.37	
12000	22×45 3.09	25.4×40 3.22	30×30 3.15				25.4×50 3.78	30×40 3.75	35×30 3.67					35×45 4.78	
15000		25.4×45 3.62	30×35 3.57	35×30 3.65				30×45 4.19	35×35 4.12					35×50 5.24	40×40 5.13
18000		25.4×50 3.98	30×40 3.95	35×35 4.06					35×40 4.52						40×50 5.76
22000			30×45 4.36	35×35 4.28					35×45 4.95	40×40 5.04					40×50 5.98
27000				35×45 4.92	40×40 5.01					40×50 5.92					40×60 6.61

WV / μF \ ØD	63					80					100				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
820						22×25 1.37					22×30 1.46	25.4×25 1.51			
1000						22×30 1.62	25.4×25 1.67				22×35 1.71	25.4×30 1.77			
1200	22×25 1.37					22×30 1.67	25.4×25 1.72				22×40 1.86	25.4×35 1.94	30×25 1.88		
1500	22×30 1.50	25.4×25 1.54				22×35 1.98	25.4×30 2.05				22×45 2.18	25.4×40 2.28	30×30 2.23		
1800	22×30 1.64	25.4×25 1.69				22×40 2.28	25.4×35 2.37	30×25 2.30				25.4×45 2.61	30×35 2.57		
2200	22×35 1.86	25.4×30 1.92				22×45 2.51	25.4×35 2.49	30×30 2.56				25.4×50 2.85	30×40 2.83	35×30 2.76	
2700	22×40 2.17	25.4×30 2.13	30×25 2.18				25.4×45 3.03	30×35 2.99					30×45 3.27	35×35 3.22	
3300	22×50 2.53	25.4×40 2.53	30×30 2.48				25.4×50 3.33	30×40 3.30	35×30 3.23				30×50 3.59	35×40 3.55	
3900		25.4×45 2.88	30×35 2.84					30×45 3.75	35×35 3.69					35×45 4.03	
4700		25.4×50 3.20	30×40 3.17	35×30 3.10				30×50 4.10	35×40 4.06					35×50 4.40	40×40 4.31
5600			30×45 3.51	35×35 3.46					35×45 4.44						40×50 4.88
6800			30×50 3.92	35×40 3.88					35×50 4.90	40×40 4.80					40×50 5.18
8200				35×45 4.22						40×50 5.32	← Case size ØD×L (mm) ← Ripple current (Arms) at 105°C, 120Hz				
10000				35×50 4.74	40×40 4.64										

HK series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
220									22×25 0.95			
270					22×25 1.05				22×25 1.17			
330	22×25 1.01				22×25 1.23				22×30 1.38	25.4×25 1.45		
390	22×25 1.09				22×30 1.55	25.4×25 1.59			22×35 1.58	25.4×30 1.62		
470	22×30 1.47				22×30 1.56	25.4×25 1.61			22×40 1.73	25.4×30 1.71	30×25 1.73	
560	22×30 1.70	25.4×25 1.76			22×35 1.79	25.4×30 1.76	30×25 1.81		22×45 1.89	25.4×35 1.96	30×30 1.93	
680	22×35 1.89	25.4×30 1.86			22×40 2.07	25.4×35 2.06	30×30 2.12			25.4×40 2.15	30×30 2.15	35×25 2.28
820	22×40 2.18	25.4×35 2.16				25.4×40 2.20	30×30 2.22	35×25 2.27			30×35 2.46	35×30 2.51
1000	22×45 2.51	25.4×40 2.51	30×30 2.45			25.4×45 2.55	30×35 2.60	35×30 2.67			30×40 2.79	35×35 2.78
1200		25.4×50 2.72	30×35 2.69	35×30 2.76			30×40 2.88	35×30 2.96			30×45 3.15	35×40 3.15
1500		25.4×50 3.18	30×40 3.15	35×30 3.08			30×45 3.32	35×35 3.41				35×45 3.78
1800			30×45 3.60	35×35 3.65			30×50 3.82	35×40 3.92				35×50 4.20
2200			30×50 4.13	35×40 4.10				35×50 4.35				
2700				35×50 4.61								

WV / ØD / μF	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
68									22×20 0.47			
82					22×20 0.62				22×25 0.55			
100	22×25 0.58				22×25 0.74				22×25 0.72			
120	22×25 0.68				22×25 0.79				22×30 0.83	25.4×25 0.82		
150	22×25 0.76	25.4×25 0.78			22×30 0.94	25.4×25 0.91			22×35 0.92	25.4×25 0.90		
180	22×30 0.78	25.4×25 0.80			22×35 1.07	25.4×25 1.06			22×40 1.12	25.4×35 1.05	30×25 1.09	
220	22×35 0.93	25.4×30 0.95	30×25 0.98		22×40 1.18	25.4×30 1.18	30×25 1.20			25.4×35 1.18	30×30 1.20	
270	22×40 1.06	25.4×30 1.04	30×25 1.08			25.4×35 1.37	30×25 1.35			25.4×40 1.35	30×30 1.37	35×25 1.40
330	22×45 1.23	25.4×35 1.23	30×30 1.25	35×25 1.29		25.4×40 1.51	30×30 1.50	35×25 1.46			30×35 1.56	35×30 1.54
390		25.4×40 1.43	30×30 1.39	35×25 1.43			30×35 1.63	35×30 1.67			30×40 1.69	35×30 1.67
470		25.4×45 1.64	30×35 1.63	35×30 1.66			30×40 1.85	35×30 1.88				35×35 1.90
560			30×40 1.85	35×35 1.90				35×35 2.08				35×40 2.06
680			30×45 2.11	35×35 2.09				35×40 2.38				35×50 2.45
820				35×40 2.38				35×45 2.65				
1000				35×45 2.71								

WV / ØD / μF	500			
	22	25.4	30	35
82	22×35 0.72	25.4×30 0.75		
100	22×40 0.83	25.4×35 0.82	30×25 0.84	
120	22×45 0.93	25.4×35 0.93	30×30 0.91	35×25 0.82
150		25.4×40 1.08	30×35 1.04	35×25 1.04
180		25.4×45 1.20	30×40 1.20	35×30 1.12
220			30×45 1.33	35×35 1.26
270			30×50 1.50	35×40 1.42
330			30×55 1.59	35×45 1.60
390				35×50 1.80
470				35×60 2.06

← Case size ØD×L (mm)
← Ripple current (Arms) at 105°C, 120Hz

HG High Ripple Series

· High ripple current compared with HK series
· Load life of 3000 hours at 105˚C
· Complied to the RoHS directive

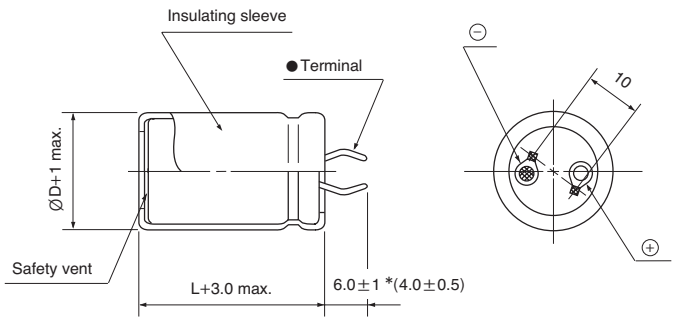
HK ⇨ HG
High Ripple



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105˚C, WV ≧350 : -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value. WV: 250 / 400 / 450 tanδ: 0.15 / 0.15 / 0.20
Load life (after application of the rated voltage for 3000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

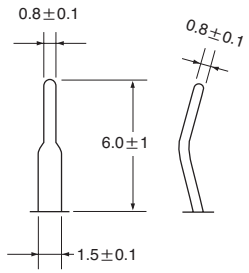
DRAWING

Unit : mm



PC Board Mounting Holes

Terminal



* Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	250				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
150									22×35 1.10	25.4×30 1.10		
180	22×20 0.88	25.4×20 0.89			22×35 1.26	25.4×25 1.25	30×20 1.29		22×40 1.32	25.4×35 1.32	30×25 1.29	35×25 1.32
220	22×25 0.93	25.4×20 1.06			22×40 1.46	25.4×30 1.47	30×25 1.43			25.4×35 1.52	30×30 1.50	35×25 1.46
330	22×30 1.35	25.4×25 1.39	30×20 1.43			25.4×40 1.95	30×30 1.93	35×25 1.89			30×35 2.03	35×30 2.20
470	22×40 1.78	25.4×30 1.74	30×25 1.80				30×40 2.20	35×30 2.48				35×40 2.59
560	22×45 2.02	25.4×35 2.01	30×25 1.98	35×25 2.01				35×35 2.82				35×45 2.93
680		25.4×40 2.43	30×30 2.29	35×25 2.34	← Case size ØD×L (mm)			35×40 3.24				35×50 3.43

↑ Ripple current (Arms) at 105˚C, 120Hz

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
250	0.85	1.00	1.20	1.25	1.45
400, 450	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

KG Wide Temperature, High Ripple Series

· High ripple current compared with HG series
· Load life of 3000 hours at 105˚C
· Complied to the RoHS directive

HG ⇨ KG
High Ripple



Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

WV	400	420	450	500
tanδ	0.15	0.20	0.20	0.20

Load life (after application of the rated voltage for 3000 hours at 105˚C)		
	Leakage current	Less than specified value
	Capacitance change	Within ±20% of initial value
	tanδ	Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4	

● DRAWING (See page 183)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	400				420			
	22	25.4	30	35	22	25.4	30	35
100					22×30 0.79	25.4×25 0.77		
120	22×30 1.23	25.4×25 1.23			22×30 0.89	25.4×25 0.87		
150	22×35 1.34	25.4×30 1.31			22×35 1.10	25.4×30 1.09	30×25 1.17	
180	22×40 1.45	25.4×30 1.44	30×25 1.69		22×40 1.31	25.4×35 1.32	30×25 1.28	
220	22×45 1.58	25.4×35 1.69	30×30 1.80		22×50 1.63	25.4×40 1.57	30×30 1.55	35×25 1.43
270	22×50 1.78	25.4×40 1.88	30×35 2.08	35×25 2.13		25.4×45 1.82	30×35 1.84	35×30 1.74
330		25.4×50 2.15	30×40 2.33	35×30 2.35			30×40 2.12	35×30 1.86
390			30×45 2.53	35×35 2.54			30×45 2.45	35×35 2.42
470			30×50 2.86	35×40 2.86			30×50 2.76	35×45 2.70

WV / ØD / μF	450				500			
	22	25.4	30	35	22	25.4	30	35
68					22×25 0.67			
82					22×30 0.77	25.4×25 0.79		
100	22×30 1.04	25.4×25 1.08			22×35 0.87	25.4×30 0.90		
120	22×35 1.17	25.4×30 1.18			22×40 0.98	25.4×30 0.98	30×25 0.99	
150	22×40 1.28	25.4×30 1.28	30×25 1.31		22×45 1.11	25.4×35 1.14	30×30 1.19	
180	22×45 1.46	25.4×40 1.43	30×30 1.63		22×50 1.24	25.4×40 1.28	30×30 1.22	35×25 1.19
220		25.4×40 1.68	30×30 1.68	35×25 1.61		25.4×50 1.46	30×35 1.39	35×30 1.34
270		25.4×50 2.08	30×35 1.89	35×30 2.14			30×40 1.58	35×35 1.51
330			30×45 2.24	35×35 2.56			30×50 1.83	35×40 1.73
390			30×50 2.52	35×40 2.74				35×45 1.91
470				35×45 3.06				35×50 2.15
560				35×50 3.11	← Case size ØD×L (mm) ← Ripple current (Arms) at 105˚C, 120Hz			35×60 2.43

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	60Hz	120Hz	300Hz	1kHz	10kHz≦
400 ~ 500	0.85	1.00	1.15	1.20	1.40

HH Surge Valtage Series

· Surge voltage for household appliance
· Load life at 3000 hours at 105°C
· Complied to the RoHS directive

HK ⟹ HH
Surge Votage



Item	Characteristics
Operating temperature range	-25 ~ +105°C
Capacitance tolerance	±20% at 120Hz, 20°C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20°C)	WV: 450 / tanδ: 0.20
Load life (after application of the rated voltage for 3000 hours at 105°C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4

● DRAWING (See page 183)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF \ ØD	450			
	22	**25.4**	**30**	**35**
68	22×25 0.51			
82	22×25 0.69			
100	22×30 0.78	25.4×25 0.78		
120	22×35 0.86	25.4×30 0.88	30×25 0.87	
150	22×40 0.95	25.4×30 0.95	30×25 0.96	35×25 0.98
180		25.4×35 1.10	30×30 1.15	35×25 1.13
220		25.4×40 1.29	30×35 1.28	35×30 1.30
270		25.4×50 1.45	30×40 1.48	35×30 1.48
330			30×45 1.60	35×35 1.62
390			30×50 1.76	35×40 1.78
470				35×45 2.12
560	Case size ØD×L (mm) ⟶ Ripple current (A rms) at 105°C, 120Hz ⟶			35×50 2.85

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	**50Hz**	**120Hz**	**300Hz**	**1kHz**	**10kHz≦**
450	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HL Long Life Series

- Long life than HK series
- Load life of 5000 hours at 105˚C
- Complied to the RoHS directive

Solvent Proof WV≦100V

Long Life

HK ⇨ HL
Long life



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105˚C, WV≧350 : -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

WV	10	16	25, 35	50, 63	80, 100	160 ~ 400	450, 500
tanδ	0.50	0.40	0.35	0.25	0.20	0.15	0.20

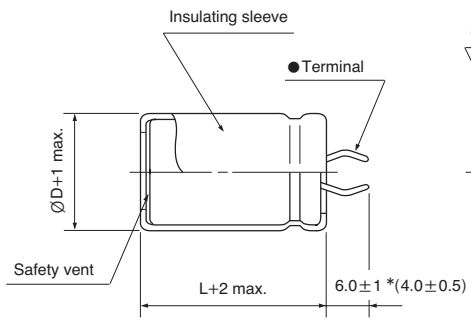
Load life (after application of the rated voltage for 5000 hours at 105˚C)

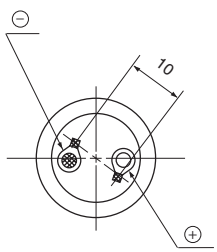
Leakage current	Less than specified value
Capacitance change	Within ±25% of initial value
tanδ	Less than 250% of specified value

Shelf life (at 105˚C): After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

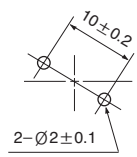
DRAWING

Unit : mm

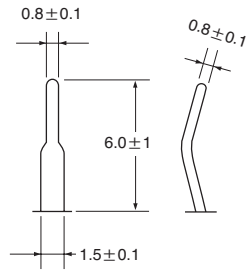




PC Board Mounting Holes



● Terminal



＊ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

HL series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	10				16				25			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
5600									22×25 1.50			
6800									22×30 1.90	25.4×25 1.90		
8200					22×25 1.80				22×35 2.10	25.4×30 2.10	30×25 2.10	
10000					22×30 2.20	25.4×25 2.20			22×40 2.30	25.4×35 2.30	30×25 2.20	
12000	22×30 2.10				22×35 2.40	25.4×30 2.40			22×40 2.50	25.4×35 2.50	30×30 2.60	
15000	22×30 2.30	25.4×25 2.30			22×40 2.70	25.4×35 2.70	30×30 2.70			25.4×40 2.80	30×35 2.90	35×30 2.90
18000	22×35 2.70	25.4×30 2.70			22×45 2.80	25.4×40 3.00	30×30 3.00	35×25 3.00		25.4×50 3.10	30×40 3.10	35×30 3.10
22000	22×40 2.90	25.4×35 2.90	30×30 2.90			25.4×40 3.10	30×35 3.30	35×30 3.30			30×45 3.50	35×35 3.50
27000	22×45 3.30	25.4×40 3.30	30×30 3.30	35×25 3.30			30×40 3.60	35×30 3.60			30×50 3.80	35×40 3.70
33000		25.4×45 3.50	30×35 3.50	35×30 3.50			30×45 4.00	35×35 4.00				35×45 4.10
39000			30×40 3.80	35×30 3.70			30×50 4.30	35×40 4.30				35×50 4.40
47000			30×45 4.00	35×35 3.90				35×45 4.60				
56000				35×40 4.50								

WV / ØD / μF	35				50				63			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
1200									22×25 1.30			
1500									22×30 1.50	25.4×25 1.50		
1800					22×25 1.30				22×35 1.60	25.4×30 1.60	30×25 1.60	
2200					22×30 1.40				22×40 1.80	25.4×30 1.80	30×30 1.80	
2700					22×30 1.60	25.4×25 1.60			22×45 2.00	25.4×35 2.00	30×30 2.00	
3300	22×25 1.50				22×35 1.80	25.4×30 1.80			22×50 2.20	25.4×40 2.20	30×35 2.20	35×25 2.20
3900	22×30 1.60				22×40 1.90	25.4×30 1.90	30×25 1.90			25.4×45 2.40	30×35 2.40	35×30 2.40
4700	22×35 1.80	25.4×25 1.80			22×40 2.00	25.4×35 2.10	30×30 2.10	35×25 2.10		25.4×50 2.60	30×40 2.60	35×35 2.60
5600	22×35 2.00	25.4×30 2.00			22×45 2.20	25.4×40 2.30	30×35 2.30	35×25 2.30			30×45 2.80	35×35 2.80
6800	22×40 2.20	25.4×35 2.20	30×25 2.20		22×50 2.40	25.4×45 2.50	30×35 2.50	35×30 2.50				35×40 3.10
8200	22×45 2.30	25.4×35 2.30	30×30 2.40	35×25 2.40			30×40 2.80	35×30 2.70				35×45 3.40
10000		25.4×40 2.50	30×35 2.60	35×25 2.50			30×45 3.00	35×35 3.00				35×50 3.80
12000		25.4×45 2.80	30×35 2.80	35×30 2.90				35×40 3.30				
15000			30×40 3.10	35×35 3.20				35×45 3.70				
18000			30×45 3.30	35×40 3.50								
22000				35×45 3.70								

WV / ØD / μF	80				100			
	22	25.4	30	35	22	25.4	30	35
680					22×25 1.10			
820	22×25 1.20				22×30 1.30	25.4×25 1.30		
1000	22×30 1.30	25.4×25 1.30			22×35 1.50	25.4×30 1.50		
1200	22×35 1.50	25.4×25 1.50			22×40 1.60	25.4×35 1.60	30×25 1.60	
1500	22×40 1.60	25.4×30 1.60	30×25 1.60		22×45 1.80	25.4×40 1.80	30×30 1.80	
1800	22×45 1.80	25.4×35 1.80	30×30 1.80			25.4×45 2.00	30×35 2.00	35×25 2.00
2200	22×50 2.00	25.4×40 2.00	30×30 2.00	35×25 2.00		25.4×50 2.20	30×40 2.20	35×30 2.20
2700		25.4×45 2.20	30×35 2.20	35×30 2.20			30×45 2.40	35×35 2.40
3300			30×40 2.40	35×35 2.40				35×40 2.70
3900			30×45 2.60	35×40 2.60				35×45 2.90
4700				35×45 3.00				
5600				35×50 3.30	← Case size ØD×L (mm) ← Ripple current (Arms) at 105°C, 120Hz			

HL series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
150					22×20 0.63				22×25 0.68	25.4×20 0.69		
180					22×20 0.69	25.4×20 0.76			22×25 0.74	25.4×20 0.76		
220	22×20 0.76				22×25 0.82	25.4×20 0.84			22×25 0.82	25.4×25 0.90	30×20 0.92	
270	22×25 0.91	25.4×20 0.93			22×25 0.91	25.4×25 1.00	30×20 1.02		22×30 0.97	25.4×25 1.00	30×20 1.02	
330	22×25 1.01	25.4×20 1.03			22×30 1.07	25.4×25 1.11	30×20 1.13		22×35 1.14	25.4×30 1.18	30×25 1.21	
390	22×25 1.09	25.4×25 1.20	30×20 1.23		22×30 1.17	25.4×25 1.20	30×25 1.31		22×40 1.30	25.4×35 1.35	30×25 1.31	35×25 1.42
470	22×30 1.28	25.4×25 1.32	30×20 1.35		22×35 1.36	25.4×30 1.40	30×25 1.44		22×45 1.50	25.4×35 1.48	30×30 1.53	35×25 1.56
560	22×35 1.48	25.4×30 1.53	30×25 1.57		22×40 1.56	25.4×30 1.53	30×25 1.57	35×25 1.70	22×50 1.71	25.4×40 1.70	30×30 1.67	35×25 1.70
680	22×40 1.72	25.4×30 1.69	30×25 1.73		22×45 1.80	25.4×35 1.79	30×30 1.84	35×25 1.88		25.4×50 2.05	30×35 1.94	35×30 1.98
820	22×45 1.98	25.4×35 1.96	30×30 2.02	35×25 2.06		25.4×45 2.16	30×30 2.02	35×25 2.06			30×40 2.23	35×35 2.29
1000	22×50 2.28	25.4×40 2.28	30×30 2.23	35×25 2.28		25.4×50 2.48	30×35 2.35	35×30 2.41			30×50 2.68	35×40 2.65
1200		25.4×45 2.41	30×35 2.38	35×30 2.44			30×40 2.50	35×35 2.57				35×45 2.80
1500		25.4×50 2.81	30×40 2.79	35×35 2.73			30×50 3.04	35×40 3.00				35×50 3.25

WV / ØD / μF	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
68	22×20 0.41	25.4×20 0.45			22×20 0.58							
82	22×25 0.48	25.4×20 0.49			22×25 0.62	25.4×20 0.69			22×25 0.67	25.4×25 0.69		
100	22×25 0.53	25.4×25 0.58	30×20 0.60		22×25 0.74	25.4×20 0.75			22×25 0.79	25.4×25 0.81	30×20 0.84	
120	22×30 0.62	25.4×25 0.64	30×20 0.65		22×25 0.86	25.4×25 0.84	30×20 0.92		22×30 0.90	25.4×25 0.89	30×25 0.92	35×20 0.99
150	22×35 0.74	25.4×30 0.76	30×25 0.78		22×30 1.02	25.4×25 0.99	30×25 1.02		22×35 1.06	25.4×30 1.11	30×25 1.09	35×25 1.11
180	22×40 0.85	25.4×30 0.83	30×25 0.86		22×35 1.16	25.4×30 1.15	30×25 1.20		22×40 1.22	25.4×30 1.22	30×25 1.20	35×25 1.22
220	22×45 0.98	25.4×35 0.98	30×30 1.00	35×25 1.03	22×40 1.35	25.4×35 1.35	30×25 1.32	35×25 1.35	22×45 1.35	25.4×35 1.40	30×30 1.39	35×25 1.35
270	22×50 1.14	25.4×40 1.14	30×30 1.11	35×25 1.14	22×45 1.58	25.4×40 1.56	30×30 1.53	35×25 1.58		25.4×40 1.54	30×35 1.62	35×30 1.56
330		25.4×45 1.31	30×35 1.30	35×30 1.33		25.4×45 1.80	30×35 1.78	35×30 1.75			30×40 2.03	35×35 1.80
390		25.4×50 1.49	30×40 1.48	35×35 1.52			30×40 2.02	35×30 2.00			30×45 2.12	35×40 2.08
470			30×45 1.69	35×35 1.67			30×45 2.31	35×35 2.29			30×50 2.14	35×40 2.14
560			30×50 1.92	35×40 1.90			30×50 2.33	35×40 2.33				35×45 2.26
680								35×45 2.37				35×50 2.51

WV / ØD / μF	500			
	22	25.4	30	35
68	22×30 0.81			
82	22×35 0.91	25.4×25 0.91		
100	22×40 1.04	25.4×30 1.04	30×25 1.01	
120	22×50 1.19	25.4×30 1.12	30×25 1.15	35×25 1.11
150	22×55 1.37	25.4×35 1.33	30×30 1.31	35×25 1.30
180	22×60 1.53	25.4×40 1.50	30×35 1.48	35×30 1.38
220		25.4×50 1.68	30×40 1.67	35×30 1.67
270			30×45 1.86	35×35 1.70
330			30×50 2.08	35×40 2.00
390				35×45 2.29
470				35×50 2.51

← Case size ØD×L (mm)
← Ripple current (Arms) at 105°C, 120Hz

JN Long Life Series

- Downsized from HL Series
- For Power supply and Inverter
- Load life of 5000 hours at 105˚C
- Complied to the RoHS directive

HL ⇨ JN
Downsizing



Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value. WV: 250 / 450 / 500 tanδ: 0.15 / 0.20 / 0.20
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±25% of the initial value tanδ: Less than 250% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 202)

Unit : mm

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	250				450				500			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
68									22×25 0.69			
100					22×25 0.79				22×30 0.85			
120					22×30 0.95				22×35 0.96			
150					22×30 1.02	25.4×25 1.00			22×40 1.11	25.4×30 1.06		
180	22×20 0.80				22×35 1.17	25.4×30 1.22			22×45 1.25	25.4×35 1.20		
220	22×25 0.96	25.4×20 1.09			22×45 1.41	25.4×30 1.23	30×25 1.30		22×50 1.40	25.4×40 1.36	30×30 1.38	35×25 1.28
270	22×25 1.12	25.4×25 1.23			22×50 1.51	25.4×40 1.54	30×30 1.51	35×25 1.48		25.4×50 1.60	30×35 1.58	35×30 1.53
330	22×30 1.35	25.4×25 1.31	30×20 1.33			25.4×45 1.72	30×35 1.75	35×30 1.70			30×40 1.79	35×35 1.74
390	22×35 1.51	25.4×30 1.49	30×25 1.50				30×40 1.90	35×35 1.88			30×45 1.98	35×40 1.95
470	22×40 1.69	25.4×30 1.65	30×25 1.60	35×20 1.62			30×45 2.04	35×35 1.97				35×45 2.16
560	22×45 1.88	25.4×35 1.88	30×30 1.79	35×25 1.80			30×50 2.20	35×40 2.14				35×50 2.38
680	22×50 2.12	25.4×40 2.12	30×30 2.18	35×25 2.30				35×45 2.41				
820		25.4×45 2.37	30×35 2.46	35×30 2.58				35×50 2.65				
1000			30×40 2.79	35×35 3.15								
1200			30×45 3.14	35×40 3.26								
1500				35×45 3.74								
1800				35×50 4.18	← Case size ØD×L (mm) ← Ripple current (A rms) at 105˚C, 120Hz							

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
250	0.85	1.00	1.20	1.25	1.45
450, 500	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

JX Snap-in Terminal Type, High Voltage Series

· Load life of 5000 hours at 105˚C
· Voltage range of 550, 600V
· Suited for use in industrial power supplies where high reliability
· Complied to the RoHS directive

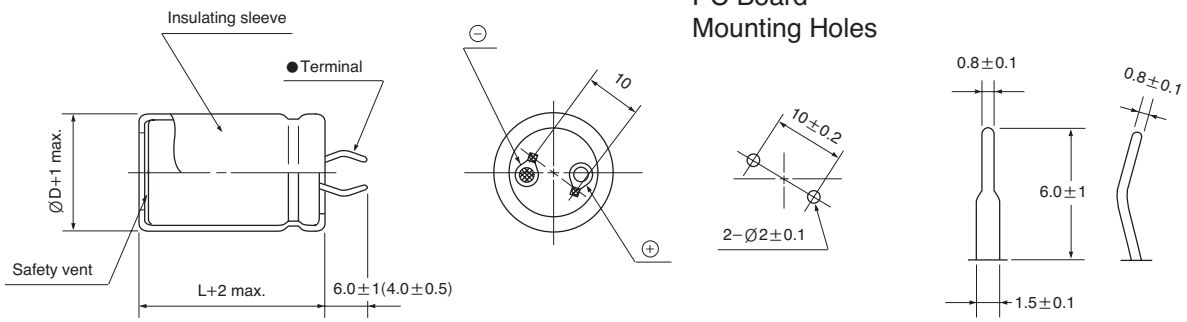
HL ⇨ JX
High Voltage



Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	WV: 550 / 600 ; tanδ: 0.20 / 0.20
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Leakage current: Less than specified value ; Capacitance change: Within ±20% of initial value ; tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING

Unit : mm



* Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	550				600			
	30		35		30		35	
120	30×30	1.04			30×40	1.11	35×30	1.10
150	30×35	1.14			30×45	1.28	35×35	1.23
180	30×40	1.31	35×30	1.26	30×50	1.41	35×40	1.41
220	30×50	1.50	35×40	1.47	30×60	1.62	35×45	1.60
270			35×45	1.67			35×50	1.80
330			35×50	1.82			35×60	2.07
390			35×60	2.04				

Ripple current (A rms) at 105˚C, 120Hz
Case size ØD×L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
550, 600	0.85	1.00	1.15	1.20	1.40

HY Snap-in Terminal Type, Long Life Series

Long Life

- Load life of 7000 hours at 105˚C
- Voltage range of 160 ~ 500V
- Suited for use in industrial power supplies where high reliability
- Complied to the RoHS directive

HL ⇨ HY
Long life



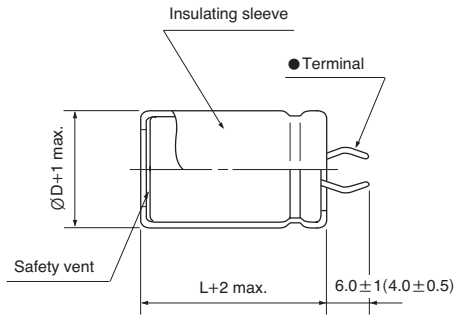
Item	Characteristics
Operating temperature range	WV<350: -40 ~ +105˚C, WV≧350: -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

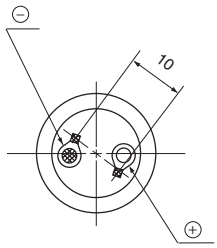
WV	160	200	250	350	400	450	500
tanδ	0.15	0.15	0.15	0.15	0.15	0.20	0.20

Load life (after application of the rated voltage for 7000 hours at 105˚C)		
	Leakage current	Less than specified value
	Capacitance change	Within ±30% of initial value
	tanδ	Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4	

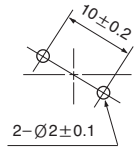
DRAWING

Unit : mm

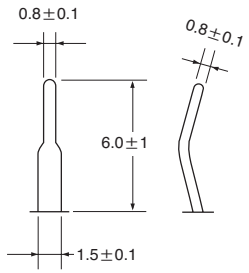




PC Board Mounting Holes



● Terminal



* Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
330	22×25 1.11				22×30 1.16	25.4×25 1.16			22×40 1.19	25.4×35 1.24	30×25 1.20	
390	22×30 1.26	25.4× 25 1.35			22×35 1.29	25.4×30 1.29	30×25 1.31		22×45 1.36	25.4×35 1.35	30×30 1.39	
470	22×30 1.39	25.4× 30 1.40			22×40 1.42	25.4×35 1.48	30×30 1.52			25.4×45 1.63	30×35 1.61	35×30 1.64
560	22×40 1.55	25.4× 30 1.55	30×25 1.57		22×45 1.63	25.4×35 1.62	30×30 1.67			25.4×50 1.85	30×35 1.75	35×30 1.80
680	22×45 1.80	25.4× 35 1.78	30×30 1.93			25.4×40 1.87	30×35 1.93				30×45 2.12	35×35 2.08
820		25.4× 40 2.06	30×30 2.01			25.4×50 2.24	30×40 2.23	35×30 2.17			30×50 2.42	35×40 2.39
1000		25.4× 45 2.38	30×35 2.34				30×45 2.57	35×35 2.52				35×45 2.76
1200		25.4× 50 2.54	30×40 2.56	35×35 2.56			30×50 2.71	35×40 2.68				35×50 2.90
1500			30×45 2.96	35×35 2.89				35×50 3.25				
1800			30×50 3.32	35×40 3.30								

WV / ØD / μF	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
56					22×20 0.48				22×30 0.52	25.4×20 0.52		
68					22×25 0.55	25.4×20 0.55			22×30 0.58	25.4×25 0.58		
82	22×25 0.58				22×30 0.63	25.4×25 0.63			22×35 0.65	25.4×30 0.65	30×20 0.65	
100	22×25 0.67	25.4×25 0.67			22×30 0.70	25.4×25 0.70			22×40 0.74	25.4×30 0.72	30×25 0.73	
120	22×30 0.77	25.4×25 0.76			22×35 0.79	25.4×30 0.79	30×25 0.79			25.4×35 0.82	30×30 0.82	
150	22×35 0.88	25.4×30 0.88			22×40 0.90	25.4×30 0.88	30×25 0.90			25.4×40 0.94	30×35 0.96	35×25 0.94
180	22×40 0.99	25.4×30 0.96				25.4×35 1.01	30×30 1.01	35×25 1.01			30×35 1.05	35×30 1.07
220	22×45 1.12	25.4×35 1.11	30×30 1.11			25.4×40 1.14	30×35 1.16	35×25 1.14			30×40 1.20	35×35 1.21
270		25.4×40 1.26	30×35 1.28	35×25 1.26			30×40 1.33	35×30 1.31				35×40 1.40
330			30×35 1.42	35×30 1.45			30×45 1.52	35×35 1.48				35×45 1.60
390			30×40 1.60	35×35 1.61				35×40 1.68				35×50 1.79
470				35×40 1.85				35×45 1.91				
560				35×45 2.06				35×50 2.14				

WV / ØD / μF	500			
	22	25.4	30	35
68	22× 35 0.41	25.4×30 0.39		
82	22× 40 0.47	25.4×30 0.46		
100	22× 40 0.55	25.4×35 0.54	30× 25 0.53	
120	22× 45 0.61	25.4×40 0.62	30× 30 0.61	35× 25 0.56
150		25.4×45 0.69	30× 35 0.72	35× 30 0.70
180			30× 40 0.84	35× 35 0.83
220			30× 45 0.97	35× 40 0.97
270			30× 50 1.17	35× 40 1.18
330				35× 50 1.32
390				35× 55 1.48
470				35× 60 1.60

← Case size ØD×L (mm)
← Ripple current (Arms) at 105˚C, 120Hz

JY Snap-in Terminal Type, Long Life Series

Long Life

- Load life of 10000 hours at 105˚C
- Voltage range of 400 ~ 500V
- Suited for use in industrial power supplies where high reliability
- Complied to the RoHS directive

HY ⇨ JY
Long life



Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	WV: 400 / 450 / 500; tanδ: 0.15 / 0.20 / 0.20
Load life (after application of the rated voltage for 10000 hours at 105˚C)	Leakage current: Less than specified value; Capacitance change: Within ±30% of initial value; tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 183)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	400				450				500			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
47					22×20 0.38							
56	22×20 0.39				22×20 0.45	25.4×20 0.43						
68	22×25 0.46	25.4×20 0.48			22×25 0.52	25.4×25 0.51			22×35 0.41	25.4×30 0.39		
82	22×30 0.54	25.4×25 0.53			22×30 0.60	25.4×30 0.59	30×20 0.57		22×40 0.47	25.4×35 0.46		
100	22×30 0.60	25.4×25 0.62			22×30 0.69	25.4×30 0.69	30×25 0.67		22×40 0.55	25.4×40 0.52	30×30 0.56	
120	22×35 0.69	25.4×30 0.72	30×25 0.69			25.4×35 0.79	30×30 0.74		22×45 0.61	25.4×45 0.59	30×35 0.62	
150	22×40 0.84	25.4×30 0.84	30×25 0.82			25.4×40 0.92	30×35 0.91	35×25 0.89			30×40 0.65	35×30 0.66
180		25.4×35 0.97	30×30 0.95	35×25 0.92			30×35 1.04	35×30 1.03			30×45 0.72	35×35 0.73
220		25.4×40 1.11	30×35 1.11	35×25 1.08			30×40 1.20	35×35 1.19				35×40 0.84
270			30×40 1.28	35×30 1.26				35×40 1.37				35×50 0.92
330			30×45 1.47	35×35 1.46				35×45 1.58				
390				35×40 1.65								
470				35×45 1.88	← Case size ØD×L (mm) ← Ripple current (A rms) at 105˚C, 120Hz							

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
400 ~ 500	0.85	1.00	1.15	1.20	1.40

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

JZ Snap-in Terminal Type, Long Life Series

Long Life

- Load life of 20000 hours at 105˚C
- Voltage range of 400V, 500V
- Suited for use in industrial power supplies where high reliability
- Complied to the RoHS directive

JY ⇨ JZ
Long life

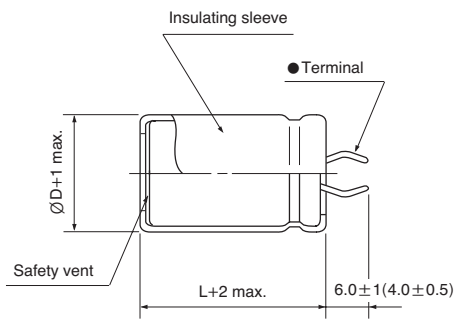


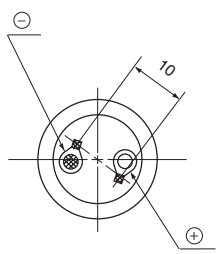
Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value
Load life (after application of the rated voltage for 20000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

WV	10	16	25, 35	50, 63	80, 100	160 ~ 400	450
tanδ	0.50	0.40	0.35	0.25	0.20	0.15	0.20

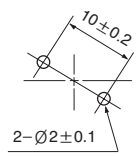
DRAWING

Unit : mm

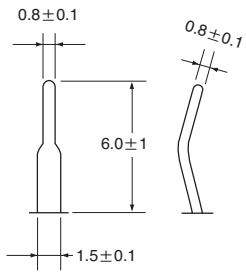




PC Board Mounting Holes



● Terminal



∗ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
350 ~	0.85	1.00	1.15	1.20	1.40

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	10				16				25			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
2200									22×20 0.56			
2700					22×20 0.58				22×25 0.68	25.4×20 0.68		
3300	22×20 0.54				22×25 0.66	25.4×20 0.66			22×25 0.74	25.4×20 0.76		
3900	22×25 0.63	25.4×20 0.63			22×30 0.74	25.4×25 0.74	30×20 0.74		22×30 0.85	25.4×25 0.85	30×20 0.85	
4700	22×25 0.71	25.4×20 0.71			22×30 0.80	25.4×25 0.80	30×20 0.80		22×30 0.97	25.4×25 0.97	30×20 1.00	
5600	22×30 0.77	25.4×25 0.77	30×20 0.77		22×35 0.86	25.4×30 0.86	30×25 0.86	35×20 0.86	22×35 1.05	25.4×30 1.05	30×25 1.10	35×20 1.10
6800	22×30 0.91	25.4×25 0.91	30×25 0.91	35×20 0.91	22×35 1.06	25.4×30 1.06	30×25 1.06	35×20 1.06	22×40 1.20	25.4×35 1.20	30×30 1.30	35×25 1.30
8200	22×35 1.05	25.4×30 1.05	30×25 1.05	35×20 1.05	22×40 1.17	25.4×35 1.17	30×30 1.17	35×25 1.17	22×45 1.35	25.4×40 1.35	30×30 1.40	35×25 1.40
10000	22×40 1.33	25.4×35 1.33	30×30 1.33	35×25 1.33	22×45 1.40	25.4×40 1.40	30×35 1.40	35×25 1.40	22×50 1.60	25.4×45 1.60	30×35 1.60	35×30 1.60
12000	22×45 1.47	25.4×40 1.47	30×35 1.47	35×25 1.47	22×50 1.60	25.4×45 1.60	30×35 1.60	35×30 1.60		25.4×50 1.75	30×40 1.75	35×35 1.75
15000	22×50 1.60	25.4×45 1.60	30×35 1.60	35×30 1.60		25.4×50 1.80	30×40 1.80	35×35 1.80			30×45 1.95	35×40 1.95
18000		25.4×50 1.89	30×40 1.89	35×35 1.89			30×45 2.00	35×40 2.00			30×50 2.20	35×45 2.20
22000			30×45 2.03	35×40 2.03			30×50 2.20	35×45 2.20				35×50 2.45
27000			30×50 2.31	35×45 2.31				35×50 2.40				
33000				35×50 2.45								

WV / ØD / μF	35				50				63			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
390									22×20 0.60			
470									22×25 0.68	25.4×20 0.68		
560					22×20 0.52				22×25 0.79	25.4×25 0.79	30×20 0.79	
680					22×25 0.58	25.4×20 0.58			22×30 0.85	25.4×25 0.85	30×20 0.85	
820					22×25 0.64	25.4×20 0.64			22×35 0.92	25.4×30 0.92	30×25 0.92	35×20 0.92
1000	22×20 0.55				22×30 0.70	25.4×25 0.70			22×40 1.00	25.4×30 1.00	30×25 1.10	35×20 1.10
1200	22×25 0.60	25.4×20 0.60			22×30 0.76	25.4×25 0.76	30×20 0.76		22×45 1.10	25.4×35 1.10	30×30 1.20	35×25 1.20
1500	22×25 0.68	25.4×25 0.68	30×20 0.68		22×35 0.82	25.4×30 0.82	30×25 0.82	35×20 0.82	22×50 1.33	25.4×40 1.33	30×30 1.33	35×25 1.33
1800	22×30 0.75	25.4×30 0.75	30×25 0.75	35×20 0.75	22×40 0.94	25.4×35 0.94	30×30 0.94	35×25 0.94		25.4×45 1.47	30×35 1.47	35×30 1.47
2200	22×35 0.82	25.4×30 0.82	30×25 0.86	35×20 0.86	22×45 1.07	25.4×40 1.07	30×35 1.07	35×25 1.07		25.4×50 1.61	30×40 1.61	35×35 1.61
2700	22×40 0.95	25.4×35 0.95	30×25 0.95	35×25 0.95	22×50 1.13	25.4×45 1.13	30×40 1.13	35×30 1.13			30×45 1.75	35×40 1.75
3300	22×45 1.10	25.4×40 1.10	30×30 1.10	35×25 1.10		25.4×50 1.43	30×45 1.43	35×35 1.43			30×50 2.00	35×45 2.00
3900	22×50 1.32	25.4×45 1.32	30×35 1.32	35×30 1.32			30×45 1.59	35×35 1.59				35×50 2.20
4700		25.4×45 1.50	30×40 1.50	35×30 1.60			30×50 1.82	35×40 1.82				
5600		25.4×50 1.80	30×45 1.80	35×35 1.80				35×45 2.00				
6800			30×50 2.05	35×40 2.10				35×50 2.25				
8200				35×45 2.33								
10000				35×50 2.50								

WV / ØD / μF	80				100			
	22	25.4	30	35	22	25.4	30	35
220	22×20 0.58				22×20 0.62			
270	22×25 0.65	25.4×20 0.65			22×25 0.70	25.4×20 0.70		
330	22×30 0.72	25.4×25 0.72	30×20 0.72		22×30 0.79	25.4×25 0.79	30×20 0.79	
390	22×30 0.80	25.4×25 0.80	30×20 0.80		22×35 0.85	25.4×25 0.85	30×20 0.85	
470	22×35 0.88	25.4×30 0.88	30×25 0.88	35×20 0.88	22×35 0.95	25.4×30 0.95	30×25 0.95	35×20 0.95
560	22×40 1.00	25.4×30 1.00	30×30 1.00	35×20 1.00	22×40 1.10	25.4×35 1.10	30×25 1.10	35×25 1.10
680	22×45 1.12	25.4×35 1.12	30×30 1.12	35×25 1.12	22×45 1.21	25.4×40 1.21	30×30 1.21	35×25 1.21
820	22×50 1.20	25.4×40 1.20	30×35 1.20	35×30 1.20	22×50 1.40	25.4×45 1.40	30×35 1.40	35×30 1.40
1000		25.4×45 1.40	30×40 1.40	35×35 1.40		25.4×50 1.68	30×40 1.68	35×30 1.68
1200		25.4×50 1.62	30×40 1.62	35×35 1.62			30×45 1.90	35×35 1.90
1500			30×45 1.85	35×40 1.85			30×50 2.10	35×40 2.10
1800			30×50 2.14	35×45 2.14				35×45 2.33
2200				35×50 2.26				35×50 2.50

← Case size ØD×L (mm)
← Ripple current (Arms) at 105°C, 120Hz

JZ series

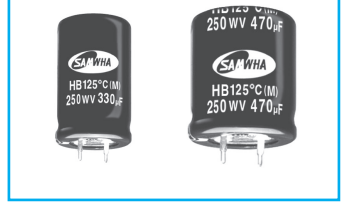
● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF \ ØD	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
82					22×20 0.52				22×20 0.50			
100					22×25 0.55				22×25 0.53	25.4×20 0.58		
120					22×25 0.58	25.4×20 0.60			22×25 0.60	25.4×25 0.64		
150	22×20 0.58				22×30 0.63	25.4×25 0.65	30×20 0.68		22×30 0.68	25.4×25 0.69	30×20 0.71	
180	22×25 0.65	25.4×20 0.70			22×35 0.69	25.4×30 0.76	30×25 0.78	35×20 0.80	22×35 0.74	25.4×30 0.76	30×25 0.78	35×20 0.80
220	22×25 0.76	25.4×25 0.80	30×20 0.86		22×40 0.78	25.4×30 0.81	30×25 0.85	35×20 0.88	22×40 0.82	25.4×35 0.90	30×25 0.92	35×25 0.95
270	22×30 0.91	25.4×25 0.93	30×20 0.98		22×45 0.91	25.4×35 1.00	30×30 1.02	35×25 1.04	22×45 0.97	25.4×40 1.00	30×30 1.02	35×25 1.10
330	22×35 1.01	25.4×30 1.03	30×25 1.06	35×20 1.08	22×50 1.07	25.4×40 1.11	30×35 1.13	35×25 1.17	22×50 1.14	25.4×45 1.18	30×35 1.21	35×30 1.28
390	22×40 1.09	25.4×30 1.20	30×25 1.23	35×25 1.26		25.4×45 1.20	30×40 1.31	35×30 1.38		25.4×50 1.30	30×40 1.31	35×30 1.44
470	22×45 1.28	25.4×35 1.32	30×30 1.35	35×25 1.40		25.4×50 1.40	30×45 1.44	35×35 1.52			30×45 1.53	35×35 1.60
560	22×50 1.48	25.4×40 1.53	30×35 1.57	35×25 1.60			30×50 1.57	35×40 1.70			30×50 1.67	35×40 1.70
680		25.4×45 1.69	30×40 1.73	35×30 1.82				35×45 1.88				35×45 1.98
820		25.4×50 1.96	30×45 2.02	35×35 2.10				35×50 2.06				35×50 2.29
1000			30×50 2.23	35×40 2.28								
1200				35×45 2.44								
1500				35×50 2.73								

WV / μF \ ØD	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
33									22×20 0.40			
47					22×20 0.40				22×25 0.42	25.4×20 0.44		
56	22×20 0.36				22×25 0.42	25.4×20 0.44			22×25 0.45	25.4×25 0.47		
68	22×25 0.41				22×30 0.45	25.4×25 0.47			22×30 0.49	25.4×30 0.52	30×20 0.54	
82	22×25 0.48	25.4×20 0.50			22×30 0.49	25.4×25 0.49	30×20 0.52		22×35 0.56	25.4×30 0.56	30×25 0.59	35×20 0.62
100	22×30 0.53	25.4×25 0.58			22×35 0.56	25.4×30 0.56	30×25 0.65	35×20 0.66	22×40 0.64	25.4×35 0.64	30×30 0.67	35×25 0.67
120	22×35 0.62	25.4×30 0.64	30×20 0.68		22×40 0.68	25.4×35 0.68	30×30 0.72	35×25 0.72	22×45 0.72	25.4×40 0.72	30×35 0.76	35×25 0.76
150	22×40 0.74	25.4×35 0.76	30×25 0.80	35×20 0.82	22×45 0.75	25.4×40 0.75	30×35 0.79	35×25 0.79		25.4×45 0.79	30×40 0.83	35×30 0.83
180	22×45 0.85	25.4×35 0.86	30×30 0.90	35×25 0.95		25.4×45 0.79	30×40 0.88	35×30 0.88			30×45 0.92	35×35 0.92
220	22×50 0.98	25.4×40 1.00	30×30 1.06	35×25 1.10			30×45 1.00	35×35 1.00				35×40 1.05
270		25.4×45 1.14	30×35 1.20	35×30 1.28				35×40 1.19				35×45 1.25
330		25.4×50 1.31	30×40 1.38	35×35 1.42				35×45 1.38				35×50 1.45
390			30×45 1.48	35×40 1.52								
470				35×45 1.67	◄— Case size ØD×L (mm) ◄— Ripple current (Arms) at 105°C, 120Hz							

HB High Temperature Range, For 125˚C Use Series

Solvent Proof
WV≦100V



- Wide operating temperature range of -40 ~ +125˚C
- With a guaranteed useful life of 10 years at 60˚C
- Ideal for industrial applications requiring continuous operation
- Complied to the RoHS directive

HE ⇨ HB
High temp.

Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +125˚C, WV≧350 : -25 ~ +125˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

WV	10	16	25	35	50, 63	80 ~ 160	200 ~ 400	450
tanδ	0.50	0.40	0.30	0.25	0.20	0.17	0.15	0.20

Load life (after application of the rated voltage for 1000 hours at 125˚C)

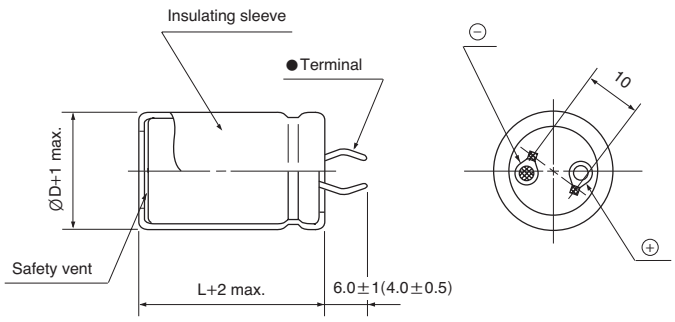
Leakage current	Less than specified value
Capacitance change	Within ±20% of initial value
tanδ	Less than 200% of specified value

400WV, 450WV products are for 3000 hours

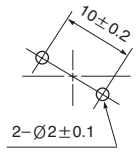
Shelf life (at 125˚C): After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

DRAWING

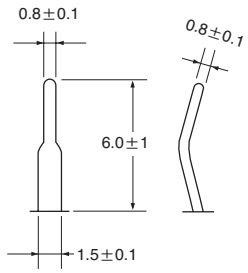
Unit : mm



PC Board Mounting Holes



● Terminal



＊ Shorter terminal(4.0±0.5) is also available upon request.
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
400 ~	0.85	1.00	1.15	1.20	1.40

HB series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / ØD / μF	10				16				25			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
1500									22×30 0.95			
2200					22×30 1.00				22×40 1.28	25.4×30 1.26		
3300	22×30 1.09				22×40 1.36	25.4×35 1.41			22×50 1.72	25.4×40 1.72	30×30 1.68	
4700	22×40 1.45	25.4×35 1.51			22×50 1.78	25.4×40 1.77	30×30 1.74			25.4×50 2.23	30×40 2.22	35×30 2.17
6800	22×50 1.91	25.4×40 1.91	30×35 1.97				30×40 2.31	35×30 2.26			30×50 2.90	35×40 2.87
10000			30×45 2.62	35×35 2.57				35×45 3.14				
15000				35×45 3.44								

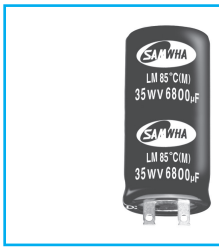
WV / ØD / μF	35				50				63			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
470									22×35 0.69	25.4×30 0.71		
680					22×30 0.78				22×40 0.87	25.4×35 0.91	30×30 0.93	
1000	22×30 0.85				22×40 1.06	25.4×30 1.04				25.4×45 1.21	30×35 1.19	35×30 1.22
1500	22×40 1.16	25.4×30 1.14			22×50 1.42	25.4×40 1.42	30×30 1.39				30×45 1.60	35×40 1.65
2200	22×50 1.54	25.4×40 1.54	30×30 1.50				30×40 1.86	35×35 1.91				35×50 2.16
3300			30×40 2.04	35×35 2.09				35×40 2.45				
4700				35×40 2.61								

WV / ØD / μF	80				100				160			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
150									22×30 0.37			
220					22×30 0.48				22×40 0.50	25.4×30 0.49		
330	22×30 0.59				22×40 0.66	25.4×30 0.65			22×50 0.67	25.4×40 0.67	30×30 0.65	
470	22×40 0.79	25.4×35 0.82			22×50 0.86	25.4×40 0.86	30×35 0.89			25.4×50 0.87	30×40 0.86	35×30 0.84
680		25.4×40 1.04	30×35 1.07				30×40 1.12	35×30 1.09			30×50 1.12	35×40 1.11
1000			30×45 1.42	35×35 1.40				35×40 1.46				35×50 1.46
1500				35×45 1.86								

WV / ØD / μF	200				250				400		450	
	22	25.4	30	35	22	25.4	30	35	30	35	30	35
100					22×30 0.32							
150	22×35 0.42				22×40 0.44	25.4×30 0.43						
220	22×45 0.56	25.4×40 0.58	30×30 0.57		22×50 0.58	25.4×40 0.58	30×35 0.60	35×30 0.61				
270											30×40 1.31	35×30 1.34
330		25.4×50 0.77	30×40 0.77	35×30 0.75			30×45 0.80	35×35 0.79	30×35 1.41	35×30 1.48	30×45 1.48	35×35 1.51
390									30×45 1.61	35×35 1.64	30×50 1.64	35×40 1.70
470			30×50 0.99	35×40 0.98				35×45 1.03	30×50 1.80	35×40 1.86	30×60 1.87	35×45 1.91
560									30×55 2.01	35×45 2.08		35×55 2.17
680				35×50 1.28	← Case size ØD×L (mm) ← Ripple current (A rms) at 125°C, 120Hz					35×50 2.34		35×60 2.43
820										35×60 2.67		

LM Lug Terminal Type Series

Solvent Proof
WV≦100V



- Lug terminal series
- Suited for use in power supplies and industrial controls
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +85°C, WV≧350 : -25 ~ +85°C
Capacitance tolerance	±20% at 120Hz, 20°C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.

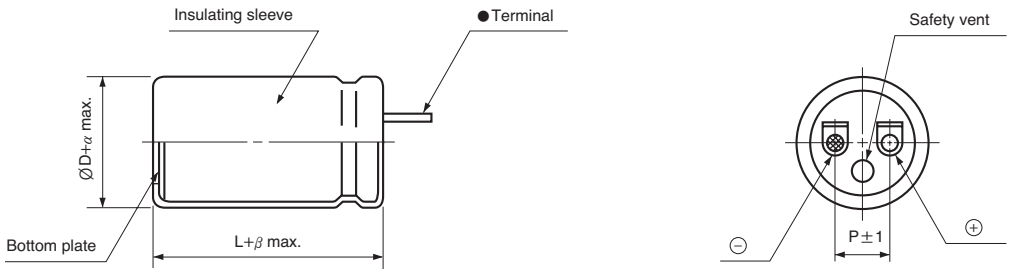
WV	16	25	35~63	80~350	400~450
tanδ	0.35	0.30	0.25	0.20	0.25

Load life (after application of the rated voltage for 2000 hours at 85°C)	
Leakage current	Less than specified value
Capacitance change	Within ±20% of initial value
tanδ	Less than 200% of specified value

Shelf life (at 85°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4

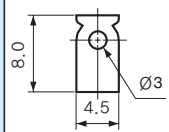
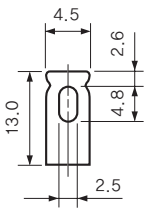
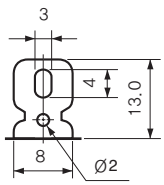
DRAWING

Unit : mm



TERMINAL

For solder tag

ØD	≦35	40	51
Dimensions			
Code	LC	LA	LD

ØD	25.4	30	35	40	51
P	10	10	14	18	18
α	1				2
β	2				3

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.85	1.00	1.06	1.15	1.20
160 ~ 250	0.85	1.00	1.20	1.25	1.45
315 ~	0.85	1.00	1.15	1.20	1.40

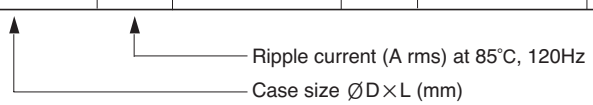
LM series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	16		25		35		40		50	
4700									25.4×30	3.21
6800					25.4×30	3.67	25.4×30	3.85	25.4×35	4.07
10000			25.4×30	3.89	25.4×35	4.53	25.4×40	4.87	30×40	5.08
15000	25.4×30	4.41	25.4×40	4.94	30×40	5.72	30×40	6.24	35×40	6.67
22000	25.4×40	5.44	30×40	6.02	35×40	6.95	35×40	7.44	35×50	7.85
33000	30×40	6.56	35×40	7.15	35×50	8.16	35×60	8.93	40×60	9.62
47000	35×40	7.54	35×50	8.15	40×60	9.45	51×60	10.8	51×70	11.0
68000	35×50	8.63	40×60	9.32	51×70	10.8				
100000	40×60	10.2	51×70	11.7						
150000	51×70	12.5								

WV / μF	63		80		100		160		200	
470									25.4×30	1.22
680							25.4×35	1.60	25.4×40	1.60
1000							25.4×40	2.09	30×35	2.09
1500					25.4×30	2.13	30×45	2.69	35×40	2.87
2200			25.4×30	2.52	25.4×40	2.75	35×45	3.40	35×50	3.81
3300	25.4×30	2.73	25.4×40	3.29	30×40	3.55	35×60	5.02	40×60	5.27
4700	25.4×35	3.50	25.4×60	4.14	35×40	4.76	40×80	6.15	51×70	6.80
6800	25.4×45	4.38	30×60	5.15	35×60	6.17	51×80	7.86		
10000	30×45	5.46	35×60	7.08	40×80	8.16				
15000	35×50	7.25	40×80	8.43	51×80	10.2				
22000	35×60	8.58	51×80	11.3						
33000	51×70	10.4								

WV / μF	250		315		350		400		450	
150									25.4×30	0.67
220			25.4×30	0.84	25.4×30	0.91	25.4×35	0.81	30×30	0.88
330	25.4×30	1.02	25.4×35	1.12	25.4×40	1.20	30×35	1.16	30×35	1.24
470	25.4×35	1.33	25.4×45	1.43	30×40	1.54	35×35	1.47	35×40	1.65
680	30×35	1.73	30×50	1.86	35×45	1.98	35×45	1.99	35×50	2.18
1000	30×45	2.25	35×50	2.56	35×60	2.96	40×60	2.78	35×70	2.77
1500	35×50	3.22	35×70	3.54	40×60	3.72	51×60	3.69		
2200	35×70	4.19	40×100	4.40	51×80	4.86				
3300	51×70	5.24	51×90	5.82						



GT Screw Terminal Type, Standard Series

- Ideally suited for use as input and output filter capacitors in power supplies
- Suited for smoothing circuits for general purpose inverters and control circuits for F.A. machines
- Designed for use as input filter capacitor for current U.P.S.
- Complied to the RoHS directive

GT ⟹ CU
Wide Temp.



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +85˚C, WV ≧350 : -25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)

Dissipation factor max. (at 120Hz, 20˚C)

ØD \ WV	16	25	35	50	63	80	100	160 ~250	350 ~500
35	0.70	0.45	0.45	0.30	0.25	0.25	0.20	0.15	0.25
51	1.00	0.60	0.60	0.45	0.35	0.30	0.20	0.15	0.25
63.5	1.30	0.80	0.70	0.50	0.40	0.35	0.25	0.20	0.25
76.2	2.00	1.60	0.90	0.70	0.50	0.45	0.35	0.25	0.25
89	2.50	2.40	1.00	0.80	0.60	0.50	0.40	0.30	0.25

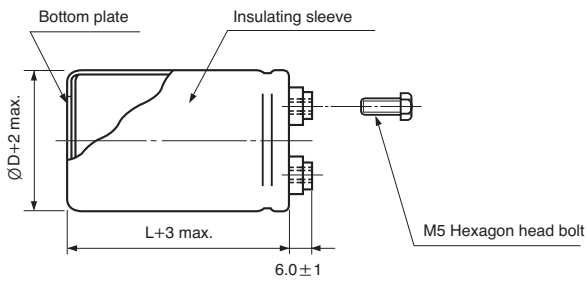
Load life (after application of the rated voltage for 2000 hours at 85˚C)

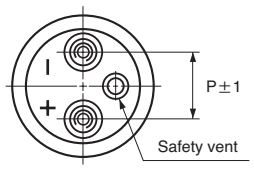
Leakage current	Less than specified value
Capacitance change	WV≦250 : Within ±15% of the initial value WV≧350 : Within ±20% of the initial value
tanδ	WV≦250 : Less than 175% of the specified value WV≧350 : Less than 300% of the specified value

Shelf life (at 85˚C): After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

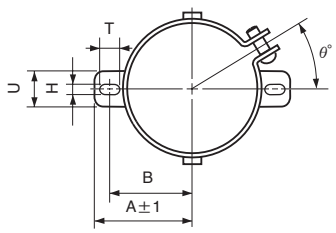
DRAWING

Unit : mm

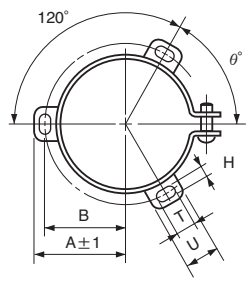




TWO LEGS ANGLE



THREE LEGS ANGLE



TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
35	24	29	7	10	30	12.7	3.5
51	33.6	39.9	6	14	30	22	4.4
63.5	38.5	45.0	8	16	45	28.6	5.0

THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
51	32.9	38.9	7	12	60	22.0	4.5
63.5	38.4	45.3	7	14	60	28.6	4.5
76.2	44.5	51.5	8	16	60	31.8	4.5
89	50.8	61	8	16	60	31.8	5.0

GT series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	16		25		35		50	
10000							35×60	6.2
15000					35×50	5.8	35×80	8.5
22000			35×60	7.5	35×70	7.9	35×100	11.3
33000	35×60	7.4	35×80	10.3	35×100	11.3	35×120	15.0
47000	35×80	9.9	35×100	13.5	35×120	14.6	51×100	15.2
68000	35×100	13.1	51×80	14.5	51×100	15.9	51×120	19.7
100000	51×80	13.7	51×100	19.2	51×120	20.7	63.5×120	24.2
150000	51×100	18.3	51×140	27.1	63.5×120	25.1	76.2×120	25.9
220000	51×140	25.4	63.5×120	28.4	76.2×120	27.7	76.2×160	35.1
330000	63.5×120	27.3	76.2×120	29.3				
470000	76.2×120	29.5						

WV / μF	63		80		100		160	
1500							35×60	3.4
2200							35×80	4.6
3300							35×100	6.2
4700					35×60	5.2	51×80	7.7
6800	35×50	5.2	35×60	5.6	35×80	7.0	51×100	10.0
10000	35×60	6.8	35×80	7.6	35×100	9.4	51×140	14.1
15000	35×80	9.3	35×120	11.1	51×80	11.8	63.5×140	16.5
22000	35×120	13.4	51×80	11.7	51×100	15.6	76.2×140	17.6
33000	51×100	14.5	51×120	16.8	51×140	22.0		
47000	51×120	18.6	63.5×100	18.5	63.5×140	25.0		
68000	63.5×100	20.8	63.5×140	25.4	76.2×140	26.2		
100000	76.2×120	25.0	76.2×140	29.7				
150000	76.2×140	32.5						

WV / μF	200		250	
330				
470				
680			35×50	2.1
1000	35×60	2.8	35×70	2.9
1500	35×70	3.6	35×80	3.8
2200	35×100	5.1	35×120	5.5
3300	35×120	6.7	51×100	7.0
4700	51×100	8.3	51×140	9.6
6800	51×140	11.5	63.5×120	10.0
10000	63.5×120	12.1	76.2×120	11.2
15000	76.2×120	13.7	76.2×160	15.3
22000	76.2×160	18.6		

← Ripple current (A rms) at 85°C, 120Hz
← Case size ØD×L (mm)

GT series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	350			400			450		
	ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)	
		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz
180							35×60	2.9	1.0
220				35×50	3.0	1.1	35×60	3.2	1.1
270	35×50	3.3	1.2	35×50	3.3	1.2	35×60	3.6	1.7
330	35×50	3.7	1.3	35×50	3.9	1.8	35×80	4.4	2.0
390	35×60	4.3	2.1	35×60	4.3	2.0	35×80	4.8	2.2
470	35×60	4.7	2.3	35×80	5.3	2.6	35×80	5.8	2.6
560	35×80	5.8	2.5	35×80	6.3	2.9	35×100	6.3	3.0
680	35×80	6.4	3.1	35×100	7.0	3.3	35×100	7.5	3.3
820	35×100	7.7	3.5	35×100	8.3	3.7	35×120	8.0	4.6
1000	35×100	9.2	4.1	35×120	8.8	4.8	51×80	9.6	5.0
1200	35×120	9.7	5.2	51×80	9.7	5.2	51×100	10.6	6.1
1500	51×80	10.8	5.9	51×100	11.8	5.9	51×100	12.7	6.7
1800	51×100	12.9	6.2	51×100	13.9	6.9	51×110	13.8	7.9
2200	51×100	15.4	7.8	51×120	16.4	8.5	51×120	16.3	8.5
2700	51×140	18.2	8.3	63.5×100	18.1	9.5	51×140	19.2	9.8
3300	51×130	20.4	10.9	51×140	22.8	10.6	51×140	20.3	11.6
	63.5×100	20.0	10.9	63.5×120	21.3	11.3	63.5×120	20.6	11.2
3900	63.5×120	23.1	12.8	63.5×130	24.4	13.1	63.5×130	23.7	11.9
				76.2×100	24.4	13.0	76.2×100	23.5	12.8
4700	63.5×130	26.8	14.3	63.5×160	26.9	13.2	63.5×160	27.8	14.0
	76.2×100	27.8	13.9	76.2×120	26.0	14.1	76.2×120	27.5	15.0
5600	76.2×120	28.4	15.0	76.2×130	30.0	16.2	76.2×130	31.3	16.8
6800	76.2×130	33.0	17.2	76.2×140	34.5	18.5	76.2×140	33.8	18.1
	89×120	32.5	17.0	89×120	34.5	19.1	89×130	33.5	18.9
8200	76.2×160	38.4	20.5	76.2×160	39.8	20.1	76.2×160	42.8	19.4
	89×140	37.8	20.3	89×130	39.8	20.9	89×140	42.8	19.7
10000	89×160	44.0	22.8	89×140	44.0	21.8	89×160	49.8	20.6
12000	89×160	47.3	24.3	89×160	47.6	22.8	89×190	58.5	21.9
15000	89×190	56.6	25.6	89×190	57.4	23.3			

WV / Item / μF	500		
	ØD×L (mm)	Ripple current (A rms)	
		40°C 120Hz	85°C 120Hz
1000	51×120	12.2	4.2
1200	63.5×100	13.1	4.5
1500	63.5×100	14.8	5.1
1800	63.5×120	17.4	6.0
2200	63.5×140	20.3	7.0
2700	76.2×120	22.3	7.9
3300	76.2×140	26.1	8.8
3900	76.2×160	27.2	10.4
4700	89×140	31.1	11.1
6800	89×160	37.8	13.5
8200	89×190	44.5	15.9

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.8	1.0	1.1	1.15	1.2
160 ~ 250	0.8	1.0	1.1	1.15	1.3
350 ~	0.8	1.0	1.2	1.35	1.4

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

GY Screw Terminal Type, High Ripple Series

- Screw terminal series in compact sizes
- High ripple guaranteed for 2000 hours load life at 85˚C
- Suited for smoothing circuits for general purpose inverters and control circuits for F.A. machines
- Designed for use as input filter capacitor for current U.P.S.
- Complied to the RoHS directive

GT ⇨ **GY**
High Ripple



Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	$I=3\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max.	0.25 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 2000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 300% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 217)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	450	
	ØD×L (mm)	**Ripple current (A rms) 85˚C 120Hz**
2700	63.5×90	11.6
3300	63.5×105	13.3
3900	63.5×115	15.1
	76.2×95	15.7
4700	63.5×135	17.8
	76.2×105	17.7
5600	76.2×115	20.0
6800	76.2×135	23.2
8200	89×125	24.8
10000	89×150	29.7

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV / Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
450	0.8	1.0	1.1	1.3	1.4

CU Screw Terminal Type, Wide Temperature Range Series

- Screw terminal series for high temperature up to 105˚C
- High ripple current capability
- Ideally suited for use as input and output filter capacitors in power supplies
- Complied to the RoHS directive

GT ⇨ CU (Wide Temp.)



Item	Characteristics
Operating temperature range	WV<350 : -40 ~ +105˚C, WV≧350 : -25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)

Dissipation factor max. (at 120Hz, 20˚C)

ØD \ WV	16	25	35	50	63	80	100	160	200, 250	350~500
35	0.50	0.45	0.40	0.30	0.25	0.25	0.20	0.15	0.15	0.25
51	0.70	0.60	0.45	0.45	0.35	0.30	0.20	0.15	0.15	0.25
63.5	1.00	0.80	0.60	0.50	0.40	0.35	0.25	0.20	0.20	0.25
76.2	1.60	1.20	0.80	0.65	0.60	0.45	0.35	0.30	0.20	0.25
89	2.50	1.50	1.00	0.80	0.70	0.50	0.40	0.35	0.25	0.25

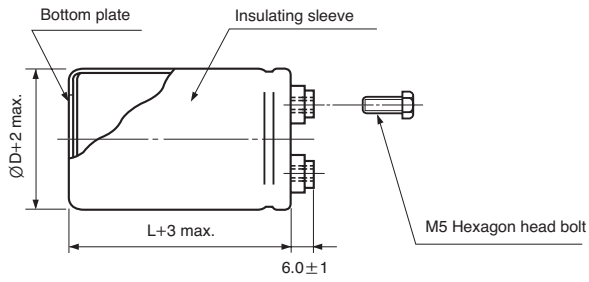
Load life (after application of the rated voltage for 2000 hours at 105˚C)

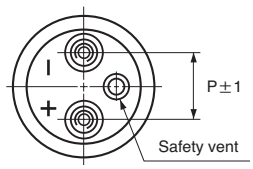
Leakage current	Less than specified value
Capacitance change	Within ±20% of initial value
tanδ	Less than 300% of specified value

Shelf life (at 105˚C): After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

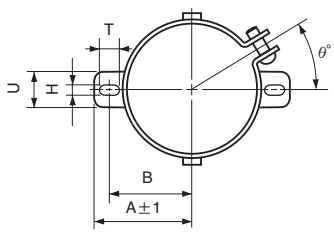
DRAWING

Unit : mm

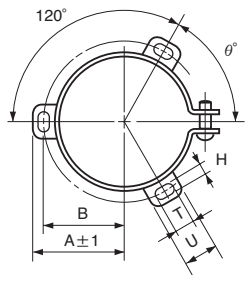




TWO LEGS ANGLE



THREE LEGS ANGLE



TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
35	24	29	7	10	30	12.7	3.5
51	33.6	39.9	6	14	30	22	4.4
63.5	38.5	45.0	8	16	45	28.6	5.0

THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
51	32.9	38.9	7	12	60	22.0	4.5
63.5	38.4	45.3	7	14	60	28.6	4.5
76.2	44.5	51.5	8	16	60	31.8	4.5
89	50.8	61	8	16	60	31.8	5.0

CU series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	16		25		35		50	
6800							35×50	3.1
10000					35×60	3.5	35×60	4.0
15000			35×50	3.8	35×80	4.8	35×80	5.5
22000	35×60	4.9	35×70	5.1	35×100	6.4	35×120	8.0
33000	35×80	6.7	35×100	7.4	35×120	8.5	51×100	8.3
47000	35×100	8.8	35×120	9.5	51×100	9.9	51×120	10.7
68000	51×80	9.5	51×100	10.3	51×120	12.8	63.5×100	12.6
100000	51×100	12.5	51×120	13.5	63.5×120	16.4	76.2×120	13.7
150000	51×140	17.6	63.5×120	16.9	76.2×120	17.4	76.2×140	17.9
220000	63.5×120	18.4	76.2×120	18.0	76.2×160	22.8		
330000	76.2×120	19.1						
470000	76.2×160	25.5						

WV / μF	63		80		100		160	
1000							35×60	1.7
1500					35×60	1.9	35×70	2.1
2200					35×80	2.6	35×100	3.0
3300					35×100	3.5	35×120	4.0
4700			35×60	3.0	51×80	4.3	51×100	5.0
6800	35×60	3.7	35×80	4.1	51×100	5.7	51×140	7.0
10000	35×80	5.0	35×100	5.4	51×140	7.9	63.5×120	7.3
15000	35×120	7.2	51×80	6.3	63.5×140	9.2	76.2×120	7.0
22000	51×80	7.0	51×100	8.3	76.2×140	11.0	76.2×160	9.4
33000	51×120	10.1	51×140	11.7				
47000	63.5×100	11.7	63.5×140	14.3				
68000	63.5×140	16.0	76.2×140	15.8				
100000	76.2×140	18.2						

Ripple current (A rms) at 105°C, 120Hz
Case size ØD×L (mm)

CU series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	200		250		350		400	
1000	35×60	1.8	35×80	2.1	35×100	3.4	51×70	3.2
1500	35×80	2.3	35×100	2.6	51×80	4.4	51×80	4.8
2200	35×120	3.3	51×80	3.4	51×100	5.7	51×120	6.4
3300	51×100	4.2	51×120	4.8	51×130	8.0	51×140	10.5
					63.5×100	7.8	63.5×120	10.5
4700	51×140	5.8	63.5×100	5.2	63.5×120	9.0	63.5×140	12.8
					76.2×100	8.8	76.2×120	12.5
6800	63.5×120	6.2	63.5×120	5.5	63.5×140	12.6	76.2×140	15.1
					76.2×120	12.4	89×120	15.4
10000	76.2×120	6.7	76.2×140	7.5	76.2×160	15.0	76.2×190	19.8
					89×140	15.3	89×160	20.1
12000	76.2×140	7.8	76.2×160	8.0	89×140	17.1	89×190	23.0
15000	76.2×160	9.2	89×140	9.4	89×190	21.5		

WV / μF	450		500	
2200	63.5×100	6.7	63.5×130	7.0
2700	63.5×120	7.9	63.5×150	8.6
3300	63.5×140	9.4	76.2×130	9.7
	76.2×100	8.7		
3900	63.5×150	10.8	76.2×150	10.7
	76.2×120	10.5		
4700	76.2×130	11.9	76.2×160	12.0
	89×120	11.9		
5600	76.2×140	13.3	89×140	13.8
	89×130	13.5		
6800	76.2×160	14.9	89×160	15.5
	89×140	14.9		
8200	76.2×190	17.7	89×190	18.0
	89×160	17.6		
10000	89×190	21.0		
12000	89×190	23.1		

Ripple current (A rms) at 105°C, 120Hz
Case size ØD×L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
~ 100	0.8	1.0	1.1	1.15	1.2
160 ~ 250	0.8	1.0	1.1	1.15	1.3
350 ~	0.8	1.0	1.2	1.35	1.4

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

GF For Inverter Circuits Series

Long Life

- Screw terminal series in compact case size
- High reliability, long life guaranteed for 5000 hours load life at 85˚C
- Suited for use in industrial power supplies for inverters
- Complied to the RoHS directive

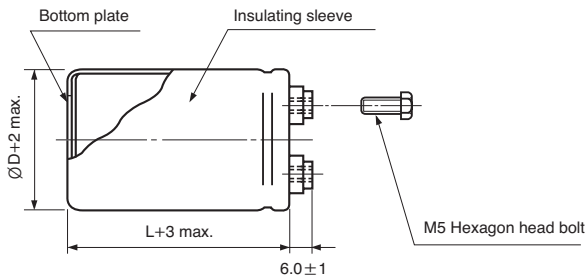
GF ⇨ GL
Long life

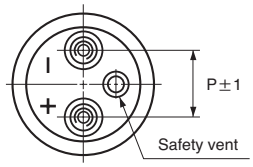


Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max.	0.25 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 5000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

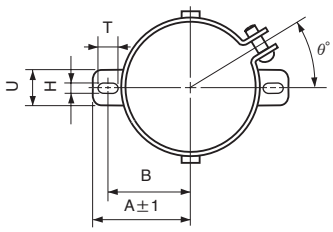
DRAWING

Unit : mm

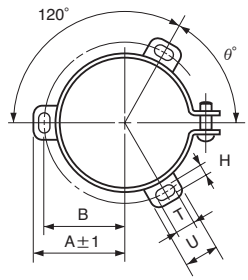




TWO LEGS ANGLE



THREE LEGS ANGLE



TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
35	24	29	7	10	30	12.7	3.5
51	33.6	39.9	6	14	30	22	4.4
63.5	38.5	45.0	8	16	45	28.6	5.0

THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
51	32.9	38.9	7	12	60	22.0	4.5
63.5	38.4	45.3	7	14	60	28.6	4.5
76.2	44.5	51.5	8	16	60	31.8	4.5
89	50.8	61	8	16	60	31.8	5.0

GF series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	350			400			450		
	ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)	
		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz
2200	51 × 80	9.6	6.0	51 × 100	13.4	8.4	51 × 120	13.8	8.6
2700	51 × 100	11.4	7.1	51 × 110	16.0	10.0	63.5 × 100	16.8	10.5
3300	51 × 110	12.0	7.5	63.5 × 100	18.6	11.6	63.5 × 110	19.0	11.9
3900	63.5 × 100	13.1	8.2	63.5 × 100	19.7	12.3	76.2 × 100	22.2	13.9
4700	63.5 × 100	15.2	9.5	63.5 × 120	23.2	14.5	76.2 × 110	24.8	15.5
5600	63.5 × 120	16.8	10.5	76.2 × 110	26.4	16.5	76.2 × 130	25.4	15.9
6800	76.2 × 110	19.7	12.3	76.2 × 120	28.0	17.5	76.2 × 150	29.4	18.4
8200	76.2 × 120	23.5	14.7	76.2 × 140	29.9	18.7	89 × 140	31.5	19.7
10000	76.2 × 140	27.7	17.3	89 × 140	32.8	20.5			
12000	89 × 140	31.2	19.5	89 × 150	33.6	21.0			

WV / Item / μF	500			550			600		
	ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)	
		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz
1000				51 × 100	6.7	4.2	51 × 100	9.8	6.5
1200				51 × 110	8.0	5.0	63.5 × 90	11.1	7.4
1500				51 × 130	9.6	6.0	63.5 × 100	13.2	8.8
1800	63.5 × 100	10.4	6.5	63.5 × 100	10.7	6.7	76.2 × 90	15.0	10.0
2200	63.5 × 120	12.3	7.7	63.5 × 120	12.8	8.0	76.2 × 100	17.9	11.9
2700	76.2 × 100	14.1	8.8	76.2 × 100	15.0	9.4	76.2 × 120	20.9	13.9
3300	76.2 × 120	16.6	10.4	76.2 × 130	17.6	11.0	76.2 × 140	24.6	16.4
3900	76.2 × 130	19.4	12.1	76.2 × 140	20.0	12.5	89 × 120	23.4	15.6
4700							89 × 140	27.5	18.3
5600							89 × 160	31.5	21.0

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV / Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
350 ~ 600	0.8	1.0	1.1	1.3	1.4

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

GR For Inverter Circuits Series

- Screw terminal series in compact case sizes
- High ripple, long life guaranteed for 5000 hours load life at 85˚C
- Suited for use in industrial power supplies for inverters
- Complied to the RoHS directive

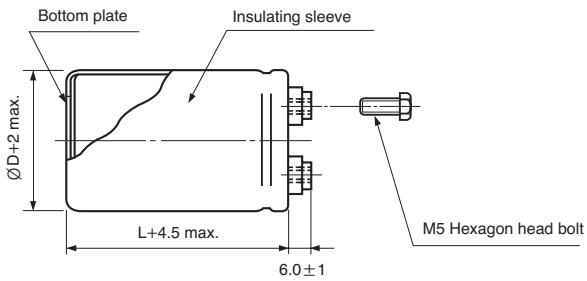
GF ⇒ **GR**
High Ripple

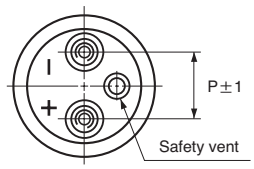


Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	0.25 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 5000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of the initial value tanδ: Less than 300% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

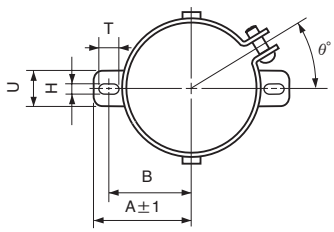
DRAWING

Unit : mm

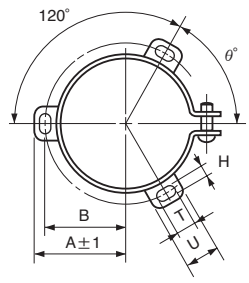




TWO LEGS ANGLE



THREE LEGS ANGLE



TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
35	24	29	7	10	30	12.7	3.5
51	33.6	39.9	6	14	30	22	4.4
63.5	38.5	45.0	8	16	45	28.6	5.0

THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ˚	P	H
51	32.9	38.9	7	12	60	22.0	4.5
63.5	38.4	45.3	7	14	60	28.6	4.5
76.2	44.5	51.5	8	16	60	31.8	4.5
89	50.8	61	8	16	60	31.8	5.0

GR series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	400			450		
	ØD×L (mm)	Ripple current (A rms)		ØD×L (mm)	Ripple current (A rms)	
		40°C 120Hz	85°C 120Hz		40°C 120Hz	85°C 120Hz
1000	51 × 60	14.0	9.3	51 × 70	15.0	10.0
1200	51 × 65	15.0	10.0	51 × 80	16.1	10.7
1500	51 × 80	17.6	11.7	51 × 90	16.8	11.2
1800	51 × 85	19.5	13.0	51 × 105	18.6	12.4
				63.5 × 70	19.4	12.9
2200	51 × 100	21.0	14.0			
	63.5 × 70	20.7	13.8	63.5 × 85	20.0	13.3
				76.2 × 65	20.3	13.5
2700	63.5 × 80	23.6	15.7	63.5 × 90	22.2	14.8
	76.2 × 65	23.1	15.4	76.2 × 75	22.2	14.8
3300	63.5 × 90	24.2	16.1	63.5 × 110	25.2	16.8
	76.2 × 70	24.8	16.5	76.2 × 85	25.1	16.7
3900	63.5 × 100	26.7	17.8	63.5 × 135	28.1	18.7
	76.2 × 80	27.8	18.5	76.2 × 90	27.6	18.4
4700	63.5 × 120	30.5	20.3	63.5 × 145	31.1	20.7
	76.2 × 90	29.7	19.8	76.2 × 110	31.1	20.7
5600	63.5 × 135	33.9	22.6	63.5 × 165	34.7	23.1
	76.2 × 100	32.7	21.8	76.2 × 130	35.0	23.3
				89 × 95	37.7	25.1
6800	63.5 × 165	38.6	25.7			
	76.2 × 120	37.4	24.9	76.2 × 145	38.6	25.7
	89 × 90	42.6	28.4	89 × 115	44.6	29.7
8200	76.2 × 140	42.3	28.2	76.2 × 185	44.1	29.4
	89 × 105	47.9	31.9	89 × 135	49.4	32.9
10000	76.2 × 165	47.9	31.9			
	89 × 120	53.9	35.9	89 × 155	55.2	36.8

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV / Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
400, 450	0.8	1.0	1.1	1.3	1.4

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

New

GJ,GL Screw Terminal Type, Long Life Series

Long Life



- Screw terminal series in compact case sizes
- High reliability, long life guaranteed for 20000 hours load life at 85˚C
- Suited for use in industrial power supplies for inverters
- Complied to the RoHS directive
- GJ series is load life of 12000 hours at 85˚C
- GL series is load life of 20000 hours at 85˚C

Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3$\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max.	0.25 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 12000, 20000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 217)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	350		400		450	
	ØD×L (mm)	Ripple current (A rms) 85˚C 120Hz	ØD×L (mm)	Ripple current (A rms) 85˚C 120Hz	ØD×L (mm)	Ripple current (A rms) 85˚C 120Hz
1500					51×110	7.3
1800			51×110	8.2	51×130	8.7
2200	51×110	8.8	51×130	9.3	63.5×110	9.6
2700	51×130	10.3	63.5×110	10.8	63.5×130	11.3
3300	63.5×100	11.8	63.5×130	12.9	76.2×110	13.5
3900	63.5×110	13.0	76.2×100	15.0	76.2×130	15.3
4700	76.2×100	15.2	76.2×130	16.0	76.2×150	16.9
5600	76.2×110	18.3	76.2×150	18.3	76.2×160	21.8
6800	76.2×130	20.5	76.2×160	21.2	89×150	23.6
8200	76.2×150	23.5	89×150	24.6	89×160	26.5
10000	89×150	27.1	89×160	29.3		
12000	89×160	32.2				

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV / Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
350 ~ 450	0.8	1.0	1.1	1.3	1.4

EV High ripple Current, High Reliability Series

Long Life

- High ripple current compared with CU series
- Long life guaranteed for 5000 hours load life at 105˚C
- Suited for the general-purpose inverter
- Complied to the RoHS directive

CU ⇨ EV
Long life



Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	$I = 3\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max.	0.20 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value 500WV products are for 2000hours
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 217)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	400		450		500	
	ØD×L (mm)	Ripple Current (A rms) 105˚C 120Hz	ØD×L (mm)	Ripple Current (A rms) 105˚C 120Hz	ØD×L (mm)	Ripple Current (A rms) 105˚C 120Hz
1000					51 × 130	6.3
1500					63.5 × 110	8.1
2200	63.5 × 110	11.6	63.5 × 115	12.1	76.2 × 130	10.1
2700	63.5 × 115	13.7	63.5 × 130	14.3	76.2 × 140	12.6
3300	63.5 × 130	16.1	76.2 × 130	16.9	76.2 × 150	14.3
3900	63.5 × 140	18.1	76.2 × 140	20.5	89 × 160	15.0
4700	76.2 × 130	21.2	76.2 × 150	22.6	89 × 160	16.5
5600	76.2 × 150	24.3	76.2 × 160	26.8		
6800	89 × 150	27.1	89 × 150	28.2		

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency / WV	50Hz	120Hz	300Hz	1kHz	3kHz
400 ~ 500	0.8	1.0	1.1	1.3	1.4

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

EY High Reliability Long Life Series

Long Life



· High reliability, long life guaranteed for 7000 hours load life at 105˚C
· Suited for use in industrial power supplies for inverter
· Complied to the RoHS directive

EV ⇒ EY
Long life

Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	I=3√CV (μA) (after 5 minutes)
Dissipation factor max.	0.20 max. at 120Hz, 20˚C
Load life (after application of the rated voltage for 7000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING (See page 217)

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	350		400		450	
	ØD×L (mm)	Ripple current (A rms) 105˚C 120Hz	ØD×L (mm)	Ripple current (A rms) 105˚C 120Hz	ØD×L (mm)	Ripple current (A rms) 105˚C 120Hz
1500					51 ×110	6.1
1800			51 ×110	7.4	51 ×130	7.1
2200	51 ×110	8.2	51 ×130	8.8	63.5 ×110	7.8
2700	51 ×130	9.8	63.5 ×110	9.7	63.5 ×130	9.2
3300	63.5 ×100	10.3	63.5 ×130	11.4	76.2 ×110	9.9
3900	63.5 ×110	11.6	76.2 ×100	11.6	76.2 ×130	11.4
4700	76.2 ×100	12.7	76.2 ×130	14.0	76.2 ×150	13.2
5600	76.2 ×110	14.3	76.2 ×150	16.2	76.2 ×160	14.8
6800	76.2 ×130	16.8	76.2 ×160	18.3	89 ×150	17.5
8200	76.2 ×150	20.1	89 ×150	21.5	89 ×160	19.7
10000	89 ×150	23.7	89 ×160	24.3		
12000	89 ×160	26.7				

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV / Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
350 ~ 450	0.8	1.0	1.1	1.3	1.4

LW,SW

For Welding Machine Series



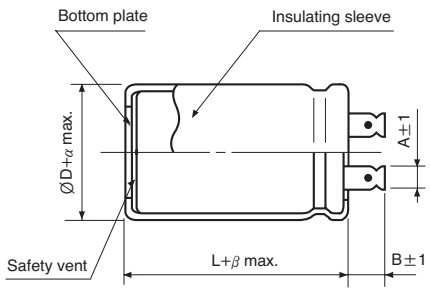
- For welding machine applications
- Charge and discharge characteristic : 100000 cycles at 5 ~ 35˚C
- LW series with lug terminal type, SW series with screw terminal type
- Complied to the RoHS directive

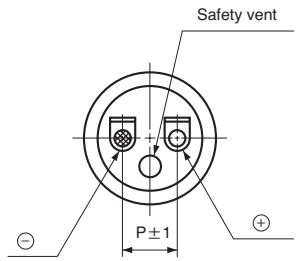
Item	Characteristics
Operating temperature range	-25 ~ +85˚C
Capacitance tolerance	-10 ~ +50% at 120Hz, 20˚C (Capacitance Tolerance “T”)
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max.	0.20 max.at 120Hz, 20˚C
Charge and discharge charateristics	After charge and discharge for 100000 cycles at 5~35˚C with application of the rate voltage, the capacitors shall be satisfied the following specifications. Leakage current : Less than 150% of specified value Capacitance change : Within ±15% of initial value tanδ : Less than 150% of specified value Conditions Charge resistance : 4Ω Charge time : 1 sec Discharge resistance : 0.12Ω Discharge time : 0.5sec

DRAWING

Unit : mm

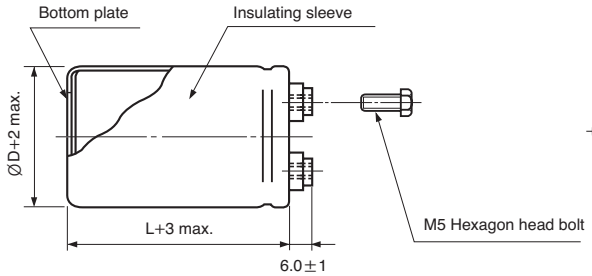
LW series

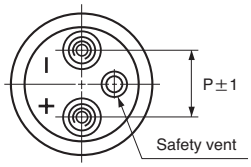




ØD	35	51
P	14	18
α	1	2
β	2	3
A	4.5	8
B	8	13

SW series





ØD	35	51	63.5	76.2
P	12.7	22	28.6	31.8

DIMENSIONS

ØD×L (mm)

WV / SERIES / μF	315		475	
	LW	SW	LW	SW
225			51×80	51×80
330	35×100			
470	51×80			51×80
1000		76.2×80		76.2×80
1500		76.2×120		
2200		76.2×160		

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

AM For Hi-Fi Component System Series

For Audio Use Solvent Proof

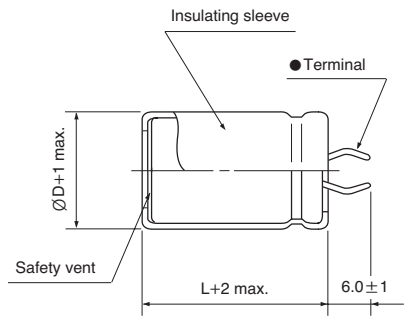


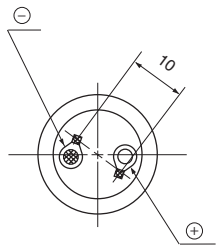
- For high grade audio equipment
- High resonance frequency, low ESR and low impedance
- For AMP, AVR
- Snap-in terminal type
- Voltage range of 16~100V
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-40 ~ +85˚C
Capacitance tolerance	±20% at 120Hz, 20˚C
Leakage current max.	$I = 3\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor max. (at 120Hz, 20˚C)	WV: 16 | 25 ~ 35 | 50 ~ 71 | 80 ~ 100 tanδ: 0.25 | 0.22 | 0.20 | 0.15
Charge and discharge characteristics	After charge and discharge for 5000 cycles at 70˚C with application of the rated voltage, the capacitors shall be satisfied the following specifications. Appearance: No visible damage and no leakage electrolyte Leakage current: Less than specified value Capacitance change: Within ±15% of initial value tanδ: Less than 150% of specified value Conditions Charge resistance : 4Ω Applied current : 1A Discharge resistance : 100Ω Charge and discharge time : 60sec. (each)
Load life (after application of the rated voltage for 2000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

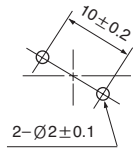
DRAWING

Unit : mm

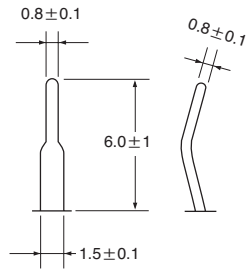




PC Board Mounting Holes



Terminal

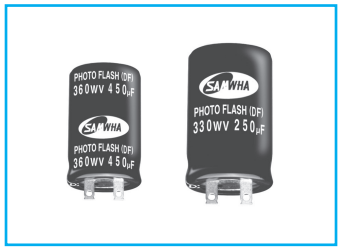


DIMENSIONS

ØD×L(mm)

μF \ WV	16	25	35	50	63	80	100
470							22×20
680						22×20	25.4×25
1000					22×20	25.4×25	25.4×30
1500				22×20	25.4×35	25.4×25	30×35
2200			22×20	25.4×20	25.4×30	30×30	35×40
3300		22×25	25.4×25	25.4×25	30×35	30×30	35×50
4700		25.4×30	25.4×30	30×40	30×40	35×40	
6800	22×35	25.4×40	30×25	30×40	35×50		
8200	25.4×30	30×40	35×30	35×40	35×50		
10000	25.4×35	35×40	35×35	35×50			
12000	30×40	35×40	35×40				
15000	35×40	35×50					
22000	35×40						
33000	35×60						

DF For Photo Flash Series

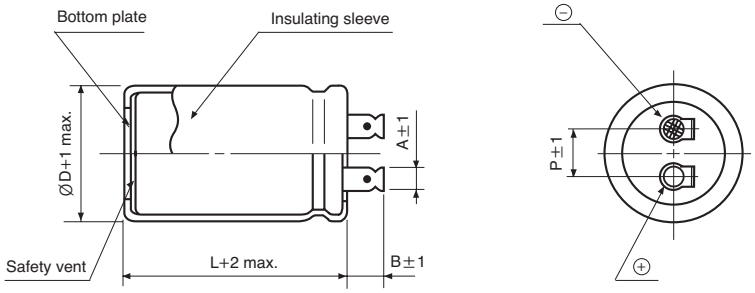


- For photo flash applications with lug terminal
- Low dissipation factor, low leakage current and high stability during the repetition of charge and discharge
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-20 ~ +55˚C
Capacitance tolerance	-10 ~ +20% at 120Hz, 20˚C
Leakage current max.	I=1×C (μA) (after 5 minutes), where C=Nominal capacitance (μF)
Dissipation factor max. (at 120Hz, 20˚C)	0.15 max. at 120Hz, 20˚C
Charge and discharge characteristics	Charge and discharge at rated voltage at 5~35˚C with a switch sequence of 30 seconds for 5000 times via xenon flash tube with discharge resistance of 0.7~1.0Ω Leakage current: Less than 150% of specified value Capacitance change: Within ±10% of initial value tanδ: Less than 150% of specified value
Shelf life	After leaving capacitors under no load at 55˚C for 1000 hours. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4 Leakage current: Less than 300% of specified value Capacitance change: Within ±10% of initial value tanδ: Less than 150% of specified value

DRAWING

Unit : mm



	ØD=22	ØD≧25.4	ØD=40 *
A	3.5	4.5	4.5
B	6.0	8.0	11.0
p	8.0	10.0	18.0

* Note : Ø40 is available upon request. Please check with us individual size and dimensions.

DIMENSIONS

ØD×L(mm)

WV / ØD / μF	330 (SV : 350)				360 (SV : 390)			
	22	25.4	30	35	22	25.4	30	35
200					22×30			
250	22×25				22×30			
300	22×30				22×40	25.4×30		
350	22×35				22×40	25.4×35		
400	22×40	25.4×30			22×45	25.4×35		
450	22×40	25.4×35			22×50	25.4×40		
500	22×45	25.4×35				25.4×45	30×35	
600		25.4×40	30×35			25.4×50	30×40	
700		25.4×45	30×35			25.4×60	30×45	
800		25.4×50	30×40				30×50	35×40
900			30×45				30×55	35×45
1000			30×45	35×40			30×60	35×55
1200			30×55	35×45			30×70	35×55
1300			30×60	35×50				35×60
1500			30×70	35×55				35×70

AL,AY

For Inverter Air-conditionings

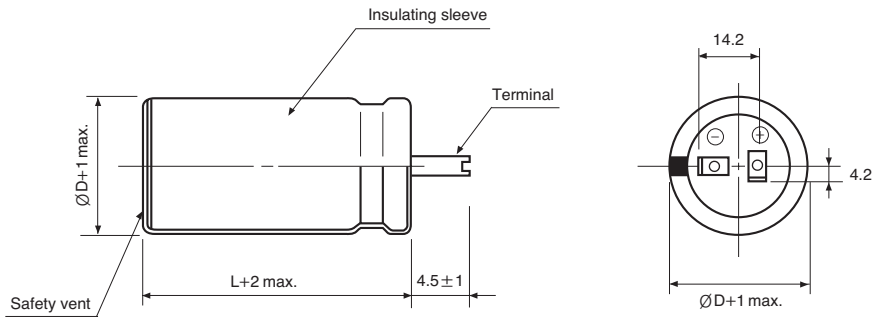


· For high ripple current application such as air conditioning system
· AL series is load life of 5000 hours at 85˚C
· AY series is load life of 10000 hours at 85˚C

Item	Characteristics
Operating temperature range	-40 ~ +85˚C
Capacitance tolerance	±10% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor (120Hz, 20˚C)	WV: 450; tanδ: 0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 450; Z-25˚C / Z+20˚C: 8; Z-40˚C / Z+20˚C: 16
Load life	The following specifications shall be satisfied when the capacitors are restored to 20˚C after subjected to DC voltage with the rated ripple current is applied for 5000/10000 hours at 85˚C: Leakage current — Less than specified value; Capacitance change — Within ±20% of initial value; tanδ — Less than 200% of specified value
Shelf life	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

DRAWING

Unit : mm



WV	WV / ØD / μF	AL		AY	
		30	35	30	35
450	330				35×30 2.30
	390		35×35 2.40		35×35 3.00
	470	30×50 2.90	35×40 2.90		35×40 3.30
	560	30×60 4.00	35×50 4.00		35×50 4.40
	680	30×70 4.40	35×60 4.40		35×60 4.60
	820		35×70 4.80	← Case size ØD×L (mm)	35×70 5.40

↑ Ripple current (A rms) at 85˚C, 120Hz

AK For Inverter Air-conditionings

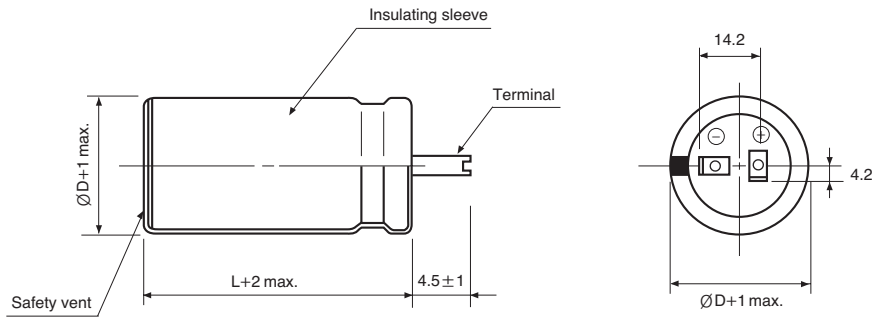


· For high ripple current application such as air conditioning system
· AK series is load life of 3000 hours at 105˚C

Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Capacitance tolerance	±10% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor (120Hz, 20˚C)	WV: 450 / tanδ: 0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 450 / Z-25˚C / Z+20˚C: 8 / Z-40˚C / Z+20˚C: 16
Load life	The following specifications shall be satisfied when the capacitors are restored to 20˚C after subjected to DC voltage with the rated ripple current is applied for 3000 hours at 105˚C: Leakage current — Less than specified value; Capacitance change — Within ±20% of initial value; tanδ — Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

DRAWING

Unit : mm



WV	μF \ ØD	30		35	
450	470	30 × 60	2.30	35 × 45	2.30
	560	30 × 60	2.85	35 × 50	2.85
	680	30 × 70	3.34	35 × 60	3.34
	820			35 × 70	3.52

Ripple current (A rms) at 105˚C, 120Hz
Case size ØD×L (mm)

AQ

For Inverter Air-conditionings

· For high ripple current application such as air conditioning system
· AQ series is load life of 5000 hours at 105˚C

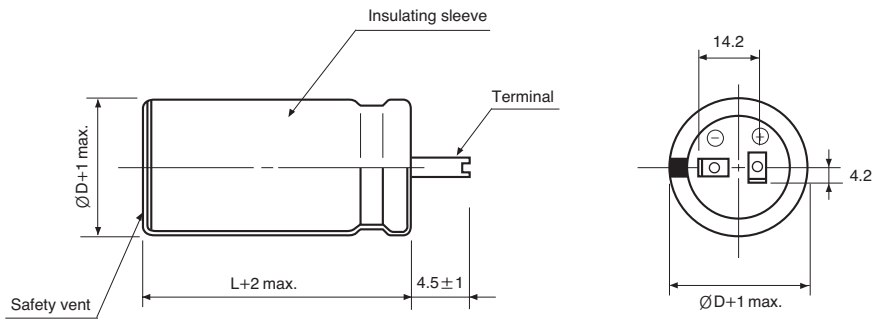
AK ⇨ AQ
Long Life



Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Capacitance tolerance	±10% at 120Hz, 20˚C
Leakage current max.	I=3 $\sqrt{CV}$ (μA) (after 5 minutes)
Dissipation factor (120Hz, 20˚C)	WV: 450 / tanδ: 0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 450 / Z-25˚C / Z+20˚C: 8 / Z-40˚C / Z+20˚C: 16
Load life	The following specifications shall be satisfied when the capacitors are restored to 20˚C after subjected to DC voltage with the rated ripple current is applied for 5000 hours at 105˚C Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4

● DRAWING

Unit : mm



WV	ØD / μF	35	
450	330	35 × 35	2.09
	390	35 × 40	2.52
	470	35 × 45	2.72
	560	35 × 50	2.92
	680	35 × 60	3.52
	820	35 × 70	3.80
		↑ Case size ØD×L (mm)	↑ Ripple current (A rms) at 105˚C, 120Hz

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- to use samwha product correctly and safety, please read application guidelines very carefully.
- please ask for our product specifications of the products and confirm they are suitable for the application before purchase and/or use.
- please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage to a third party's life.

1. aircraft / aerospace equipment
2. undersea equipment
3. power plant equipment
4. medical equipment
5. transportation equipment (vehicles, trains, ships, etc.)
6. traffic signal equipment
7. disaster prevention/crime prevention equipment
8. data-processing equipment
9. application of similar complexity and/or reliability requirements to the applications listed in the above

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