

# 6 LARGE ALUMINUM ELECTROLYTIC CAPACITORS

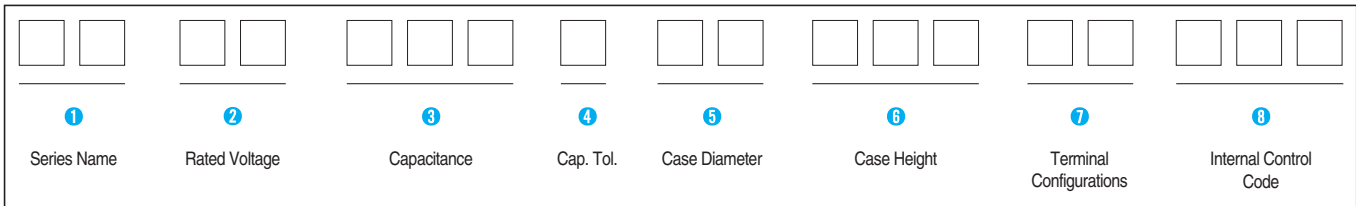
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# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## PART NUMBER SYSTEM

### ● Part Number System



**1 Series Name**  
See page 8.

**2 Rated Working Voltage**

<b>WV</b>	<b>6.3</b>	<b>10</b>	<b>16</b>	<b>25</b>	<b>35</b>
<b>Code</b>	0J	1A	1C	1E	1V
<b>WV</b>	<b>40</b>	<b>50</b>	<b>63</b>	<b>80</b>	<b>100</b>
<b>Code</b>	1G	1H	1J	1K	2A
<b>WV</b>	<b>160</b>	<b>200</b>	<b>220</b>	<b>250</b>	<b>315</b>
<b>Code</b>	2C	2D	7D	2E	2F
<b>WV</b>	<b>330</b>	<b>350</b>	<b>360</b>	<b>375</b>	<b>400</b>
<b>Code</b>	2L	2V	2Z	7S	2G
<b>WV</b>	<b>450</b>	<b>475</b>	<b>500</b>	<b>550</b>	<b>600</b>
<b>Code</b>	2W	7W	2H	7H	2X

**3 Capacitance**

ex) 47  $\mu$ F    476  
 470  $\mu$ F    477  
 4700  $\mu$ F    478  
 47000  $\mu$ F    479

**4 Capacitance Tolerance**

<b>Tolerance (%)</b>	$\pm 10$	$\pm 15$	$\pm 20$	0 +20	-10 +20	-10 +30	-10 +50	-10 +75
<b>Code</b>	K	L	M	W	V	Q	T	U

**5 Case Diameter**

ex)  $\varnothing 22$     22  
 $\varnothing 25.4$     25  
 $\varnothing 30$     30  
 $\varnothing 35$     35  
 $\varnothing 40$     40  
 $\varnothing 51$     51  
 $\varnothing 63.5$     64  
 $\varnothing 76.2$     76  
 $\varnothing 89$     89

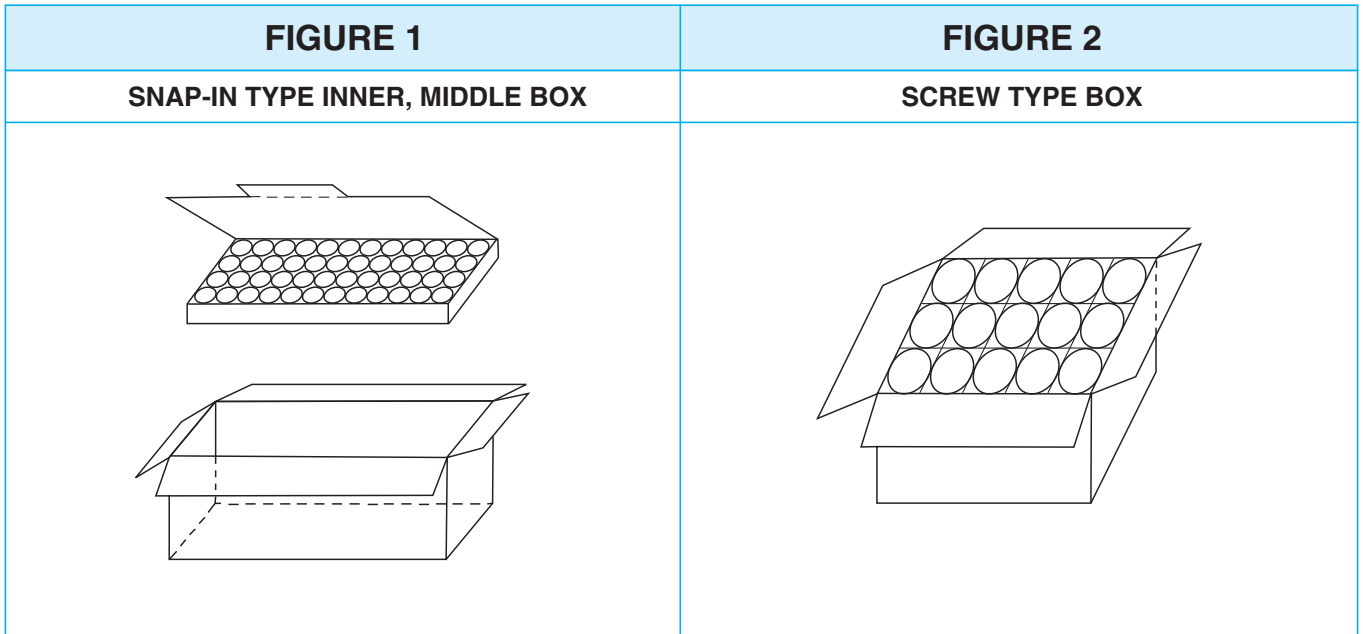
**6 Case Height**

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	$\varnothing D \leq 35$	LC
	$\varnothing D = 40$	LA
	$\varnothing D = 51$	LD
	$\varnothing D \geq 63.5$	LE
Photo Flash	$\varnothing D = 22$	PK
	$\varnothing D = 25.4, 30$	LC
	$\varnothing D = 35$	LF
Screw Terminal Type		SB
Screw Terminal Type (Stud Type)		TB
Screw Terminal Type (M6)		S6
Screw Terminal Type (Stud Type, M6)		T6

# PACKING



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

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

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

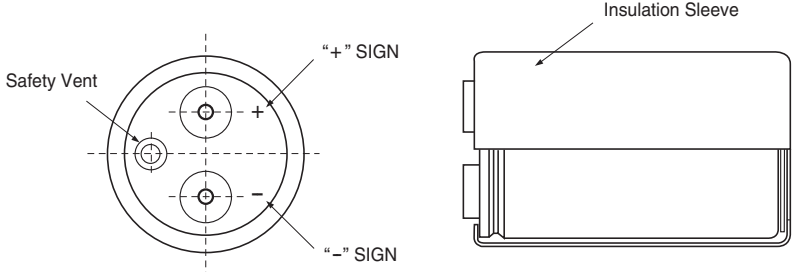
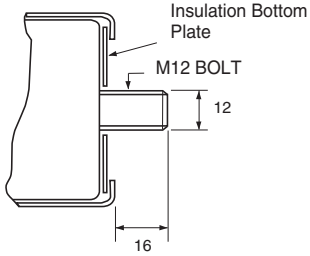
SIZE	SCREW
ØD	QUANTITY
35	45
51	23
64	16
76	12
89	9

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

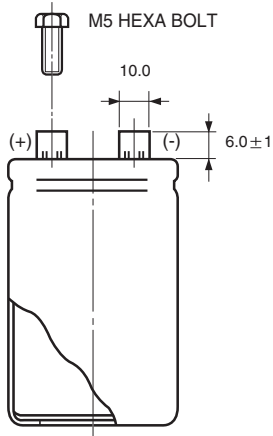
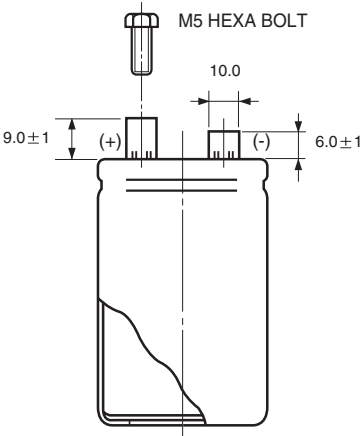
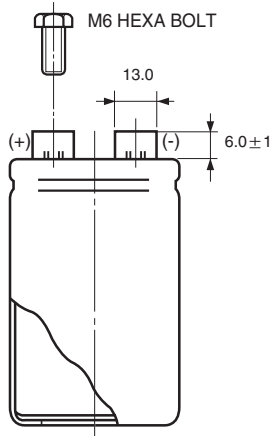
## ● SNAP-IN DRAWING

STANDARD 2 PIN (Ø22~Ø40)	2 PIN - 1 (Ø25, Ø30, Ø35)
<p>Type : HA, HC</p> <p>Insulating sleeve</p> <p>Terminal</p> <p>L</p> <p>6.0±1*(4.0±0.5) (HC)</p> <p>(HA)</p> <p>10</p> <p>10±0.2</p> <p>2-Ø2±0.1</p>	<p>Type : HR</p> <p>Insulating sleeve</p> <p>Terminal</p> <p>L</p> <p>4.0±0.5</p> <p>3.3±0.1</p> <p>4.75±0.1</p> <p>0.2-Ø2±0.1</p> <p>10±0.1</p>
3 PIN (ONLY Ø25)	4 PIN (Ø35, Ø40)
<p>Type : KT</p> <p>Insulating sleeve</p> <p>Terminal</p> <p>L</p> <p>3MAX</p> <p>7.5±1</p> <p>Blank</p> <p>Blank</p> <p>3-Ø1.3±0.1</p> <p>12.5±0.1</p> <p>10±0.1</p>	<p>Type : HA, HC (4pin)</p> <p>Insulating sleeve</p> <p>Terminal</p> <p>L</p> <p>6.0±1*(4.0±0.5)</p> <p>Blank</p> <p>Blank</p> <p>30°</p> <p>22.5</p> <p>4-Ø2±0.1</p> <p>30°</p> <p>Ø22.5±0.2</p>
5 PIN (ONLY Ø40)	
<p>Type : KP</p> <p>Insulating sleeve</p> <p>Terminal</p> <p>L</p> <p>3MAX</p> <p>7.5±1</p> <p>Blank</p> <p>Blank</p> <p>Blank</p> <p>Blank</p> <p>Blank</p> <p>20±0.1</p> <p>17.5±0.1</p> <p>10±0.1</p> <p>20±0.1</p> <p>5-Ø1.3±0.1</p>	

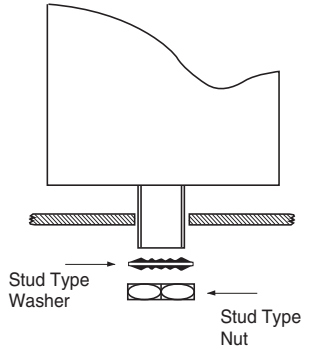
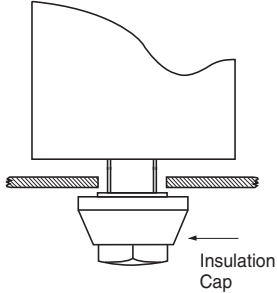


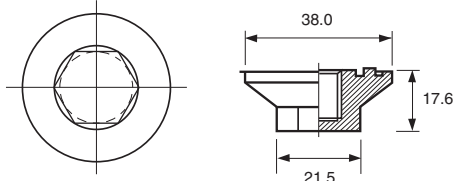
## ● SCREW CASE DRAWING

STANDARD	STUD TYPE
<p style="text-align: right;">Type : SB</p> 	<p style="text-align: right;">Type : TB</p>  <p style="text-align: right;">(ONLY Ø51,64,76)</p>

## ● T-BBOARD DRAWING

STANDARD	(+ 3mm Up)	WILD TYPE (M6 BOLT)
	 <p style="text-align: right;">(ONLY Ø76)</p>	 <p style="text-align: right;">(ONLY Ø76)</p>

## ● STUD TYPE DRAWING

NON-INSULATED VERSION	INSULATED VERSION		
		<b>Stud Type Washer</b>	
		<b>Stud Type Nut</b>	
		<b>Insulation Cap</b>	

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HC Snap-in Terminal Type, Standard Series

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



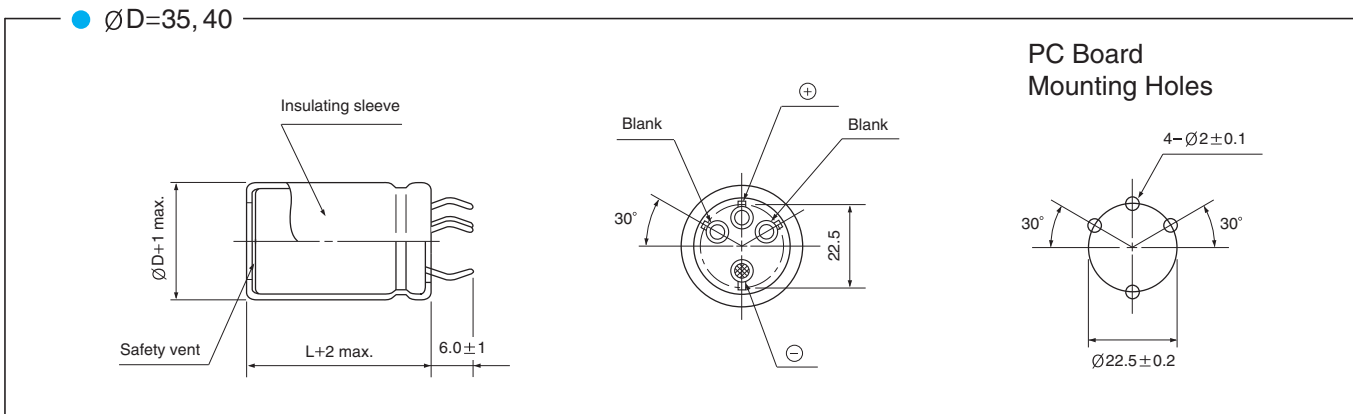
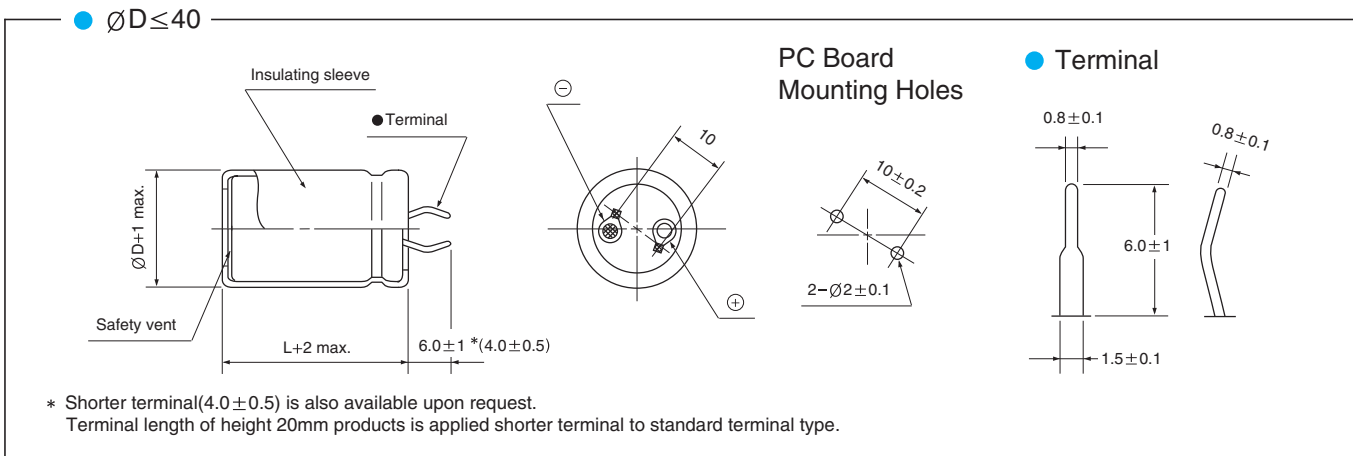
Solvent Proof  
WV ≤ 100V



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.																	
	<table border="1"> <tr> <td>WV</td> <td>6.3</td> <td>10</td> <td>16, 25</td> <td>35</td> <td>50, 63</td> <td>80, 100</td> <td>160 ~ 400</td> <td>450~550</td> </tr> <tr> <td>tanδ</td> <td>0.45</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </table>	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
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



### ● 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) ← Ripple current (Arms) at 85°C, 120Hz				
12000				35 × 45 6.83	40 × 40 6.95										

LARGE TYPES

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HC series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF ∅D	160					200					250				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
150											22×20 0.90	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 μF ∅D	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 μF ∅D	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 ∅D×L (mm)  
← Ripple current (Arms) at 85°C, 120Hz



## HJ

Snap-in Terminal Type,  
Series

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



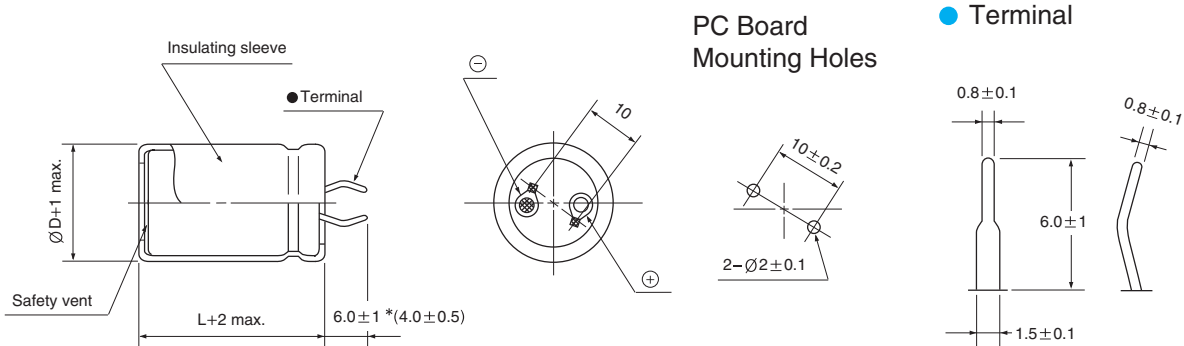
Solvent Proof  
WV ≤ 100V



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.															
	<table border="1"> <thead> <tr> <th>WV</th> <th>10</th> <th>16, 25</th> <th>35</th> <th>50, 63</th> <th>80, 100</th> <th>160 ~ 400</th> <th>450, 500</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	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
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	~ 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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**HJ** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF / ØD	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 μF / ØD	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 μF / ØD	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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS



**HJ** 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	
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 μF / ØD	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

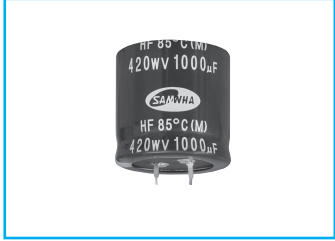
WV μF / ØD	500			
	22	25.4	30	35
56	22×20 0.50			
68	22×25 0.59	25.4×20 0.59		
82	22×30 0.68	25.4×25 0.65		
100	22×35 0.79	25.4×30 0.82	30×25 0.82	
120	22×40 0.94	25.4×35 0.94	30×25 0.95	
150	22×45 1.09	25.4×35 1.10	30×30 1.13	
180	22×50 1.27	25.4×40 1.30	30×35 1.30	35×25 1.27
220		25.4×45 1.50	30×40 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

LARGE TYPES

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HF Snap-in Terminal Type, Long life Series

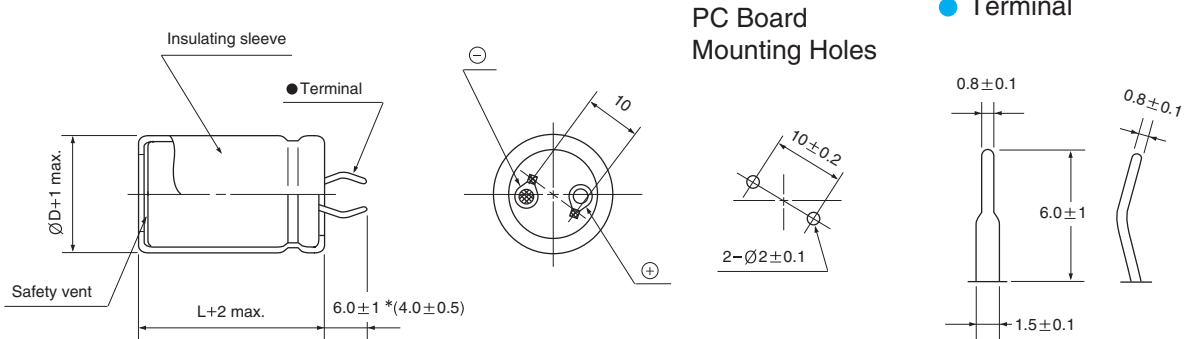
- Long life than HJ series
- Load life at 5000 hours at 85°C
- Complied to the RoHS directive



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.													
	<table border="1"> <tr> <td>WV</td> <td>160</td> <td>200</td> <td>250</td> <td>350</td> <td>400</td> <td>450</td> </tr> <tr> <td>tanδ</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> </tr> </table>	WV	160	200	250	350	400	450	tanδ	0.15	0.15	0.15	0.15	0.15
WV	160	200	250	350	400	450								
tanδ	0.15	0.15	0.15	0.15	0.15	0.20								
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													

### ● DRAWING

Unit : mm



\* Shorter terminal ( $4.0 \pm 0.5$ ) 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

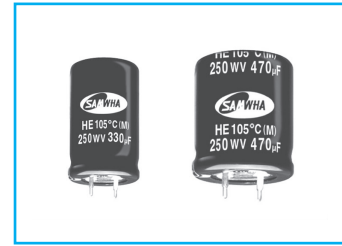
WV μF / ØD	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
150									22×20 0.97			
180					22×20 0.91				22×20 1.06			
220					22×20 1.18				22×25 1.24	25.4×20 1.22		
270	22×20 1.30				22×25 1.37	25.4×20 1.35			22×25 1.50	25.4×25 1.32		
330	22×25 1.50				22×25 1.51	25.4×20 1.49			22×30 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 μF / ØD	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								

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HE Wide Temperature Range, Standard Series

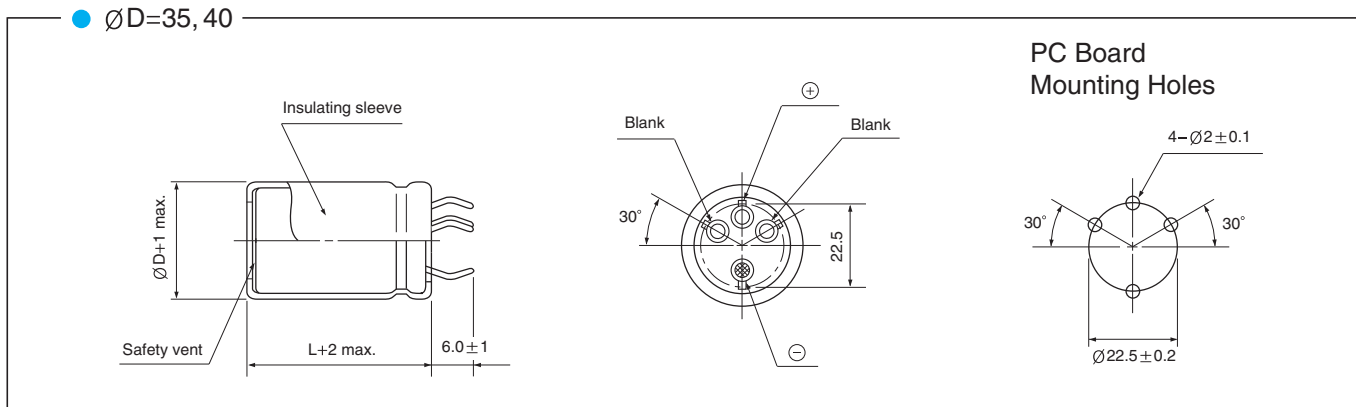
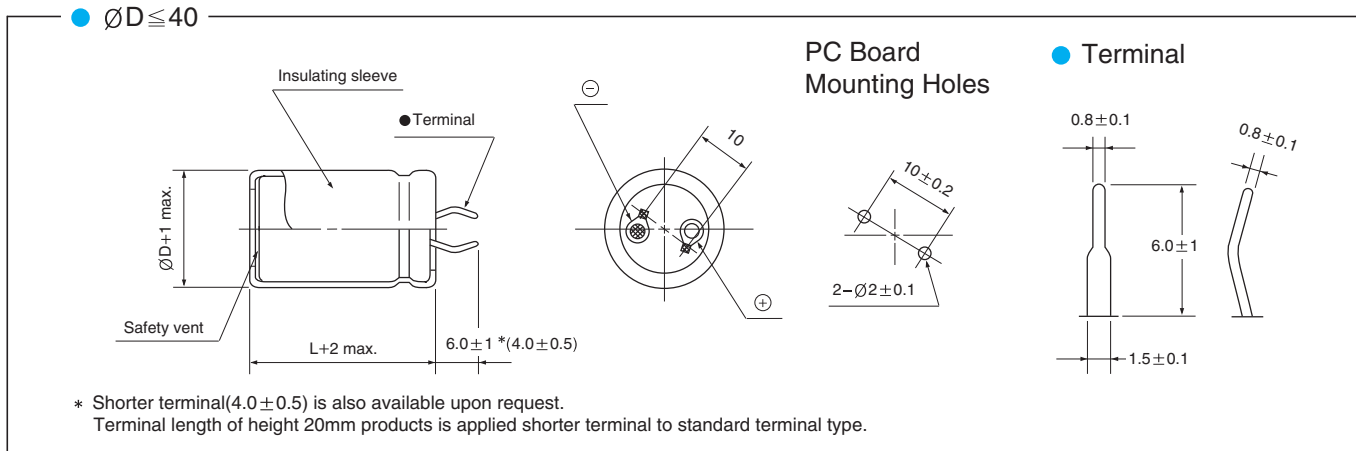
- Wide temperature range of -40(-25) ~ +105°C
- Standard snap-in terminal type
- Complied to the RoHS directive



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.															
	<table border="1"> <thead> <tr> <th>WV</th> <th>6.3, 10</th> <th>16</th> <th>25, 35</th> <th>50, 63</th> <th>80, 100</th> <th>160 ~ 400</th> <th>450 ~ 550</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	WV	6.3, 10	16	25, 35	50, 63	80, 100	160 ~ 400	450 ~ 550	tanδ	0.50	0.40	0.35	0.25	0.20	0.15
WV	6.3, 10	16	25, 35	50, 63	80, 100	160 ~ 400	450 ~ 550									
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														
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



### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

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

## HE 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					
10000				35 × 50 4.74	40 × 40 4.64										

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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**HE** series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF ØD	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 1.44	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 2.06	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 μF ØD	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 1.70				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 μF ØD	450					500					550				
	22	25.4	30	35	40	22	25.4	30	35	40	22	25.4	30	35	40
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	
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	
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	
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	
270			30×35 1.23	35×30 1.26				30×50 1.18	35×40 1.24	40×40 1.24				35×45 1.32	40×40 1.34
330			30×40 1.42	35×35 1.46					35×45 1.42	40×50 1.48				35×50 1.58	40×50 1.62
390			30×50 1.60	35×40 1.66					35×50 1.62	40×50 1.77				35×60 1.78	40×60 1.87
470				35×40 1.81	40×40 1.85				35×55 1.71	40×60 1.88					
560				35×45 2.06	40×50 2.18										

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



## JK For Printer system

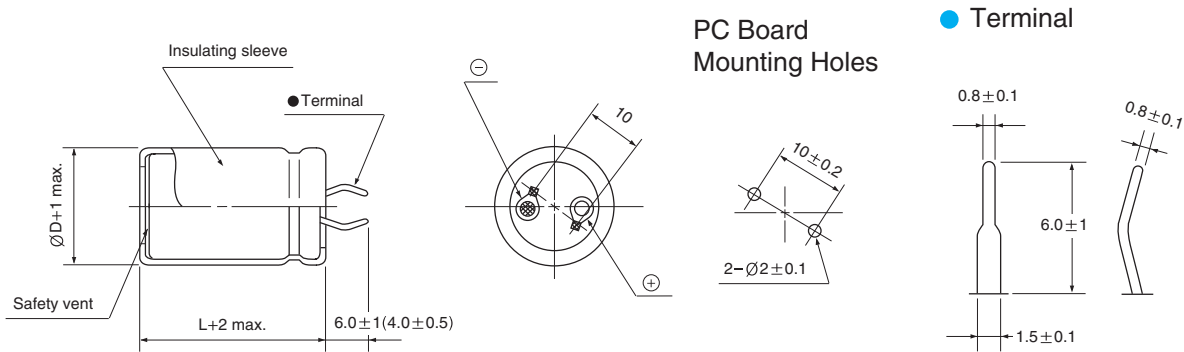
- For printer system
- No sparks DC overvoltage



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

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 ≤
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

**JK** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF / ØD	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					

## 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



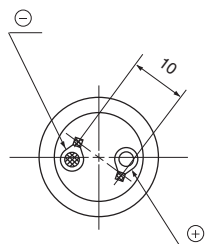
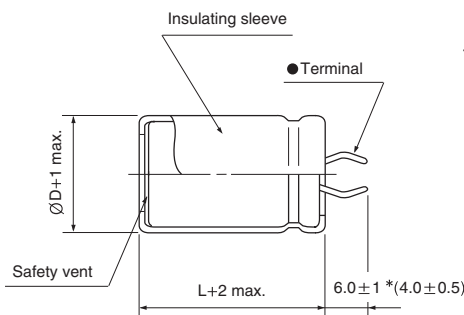
Miniaturized



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.															
	<table border="1"> <thead> <tr> <th>WV</th> <th>6.3, 10</th> <th>16</th> <th>25, 35</th> <th>50, 63</th> <th>80, 100</th> <th>160~400</th> <th>450, 500</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	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
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									
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															

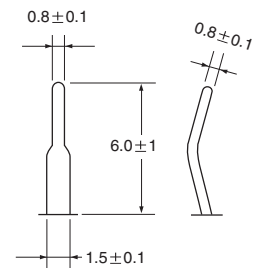
### ● DRAWING

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.

### ● 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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**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 3.65	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)				
10000				35 × 50 4.74	40 × 40 4.64						← Ripple current (Arms) at 105°C, 120Hz				

## HK series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV ∅D μF	160				200				250			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
220									22×25 0.90			
270					22×25 1.05				22×25 1.11			
330	22×25 1.01				22×25 1.23				22×30 1.31	25.4×25 1.36		
390	22×25 1.09				22×30 1.55	25.4×25 1.59			22×35 1.50	25.4×25 1.55		
470	22×25 1.47				22×30 1.56	25.4×25 1.61			22×40 1.65	25.4×30 1.63	30×25 1.68	
560	22×30 1.70	25.4×25 1.76			22×35 1.79	25.4×25 1.76	30×25 1.81		22×45 1.80	25.4×35 1.87	30×25 1.84	
680	22×35 1.89	25.4×25 1.86			22×40 2.07	25.4×30 2.06	30×25 2.12			25.4×40 2.05	30×30 2.12	35×25 2.21
820	22×40 2.18	25.4×30 2.16				25.4×35 2.20	30×30 2.22	35×25 2.27			30×35 2.34	35×30 2.44
1000	22×45 2.51	25.4×35 2.51	30×25 2.45			25.4×40 2.55	30×30 2.60	35×25 2.67			30×40 2.68	35×30 2.70
1200		25.4×40 2.72	30×30 2.69	35×25 2.76			30×35 2.88	35×30 2.96			30×45 3.00	35×35 3.00
1500		25.4×45 3.18	30×35 3.15	35×30 3.08			30×40 3.32	35×35 3.41				35×40 3.50
1800			30×40 3.60	35×30 3.65			30×50 3.82	35×40 3.92				
2200			30×45 4.13	35×35 4.10				35×45 4.35				
2700				35×40 4.61								

WV ∅D 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 0.81			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	25.4×30 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	35×25 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 ∅D 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 ∅D×L (mm)  
← Ripple current (Arms) at 105°C, 120Hz

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HG High Ripple Series

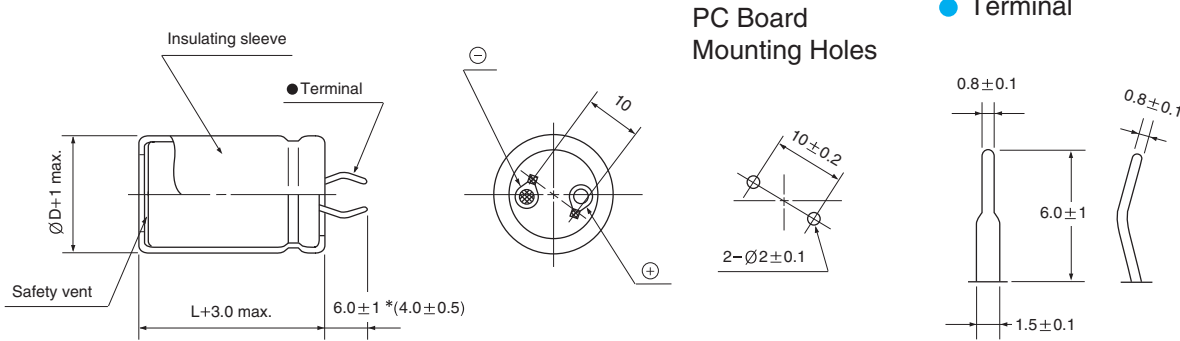
- High ripple current compared with HK series
- Load life of 3000 hours at 105°C
- Complied to the RoHS directive



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.							
	<table border="1"> <thead> <tr> <th>WV</th> <th>250</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	WV	250	400	450	tanδ	0.15	0.15
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



\* 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 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



New

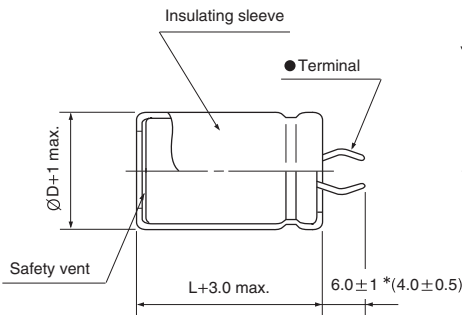
## KG Wide Temperature, High Ripple Series

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

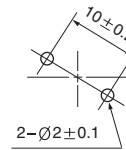


Item	Characteristics							
Operating temperature range	-40 ~ +105°C							
Capacitance tolerance	±20% at 120Hz, 20°C							
Leakage current max.	$I=3\sqrt{CV}$ (µA) (after 5 minutes)							
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000µF : tanδ increases by 0.01 for each 1000µF from below value.							
	<table border="1"> <tr> <td>WV</td> <td>400</td> <td>420</td> <td>450</td> </tr> <tr> <td>tanδ</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </table>	WV	400	420	450	tanδ	0.15	0.20
WV	400	420	450					
tanδ	0.15	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							

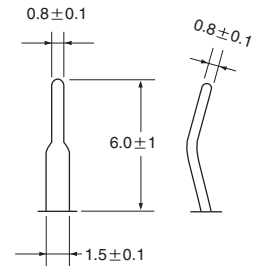
### ● DRAWING



### PC Board Mounting Holes



### ● Terminal



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 µF	ØD	400				420				450			
		22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
100													
120		22×30 0.90	25.4×25 0.86			22×30 0.77	25.4×25 0.75			22×30 0.77	25.4×25 0.98		
150		22×35 1.05	25.4×25 1.01			22×35 1.07	25.4×30 1.06	30×25 1.14		22×40 1.16	25.4×30 1.16	30×25 1.09	
180		22×40 1.32	25.4×30 1.31	30×25 1.35		22×40 1.27	25.4×35 1.28	30×25 1.24		22×45 1.39	25.4×35 1.39	30×30 1.36	
220		22×45 1.53	25.4×35 1.54	30×30 1.50		22×50 1.58	25.4×40 1.52	30×30 1.50	35×25 1.39		25.4×40 1.60	30×30 1.58	35×25 1.53
270		22×50 1.78	25.4×40 1.71	30×30 1.81	35×25 1.63		25.4×45 1.77	30×35 1.67	35×30 1.69		25.4×50 2.02	30×35 1.80	35×30 2.04
330			25.4×50 2.05	30×35 2.03	35×30 1.98			30×40 2.06	35×30 1.81			30×45 2.13	35×35 2.12
390				30×40 2.14	35×35 2.21			30×45 2.33	35×35 2.10			30×50 2.40	35×40 2.37
470				30×50 2.54	35×40 2.60			30×50 2.63	35×45 2.65				35×45 2.72

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

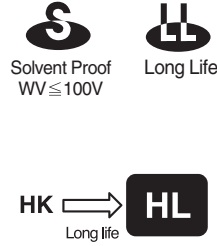
### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV	Frequency	60Hz	120Hz	300Hz	1kHz	10kHz≤
400 ~ 450		0.85	1.00	1.15	1.20	1.40

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## HL Long Life Series

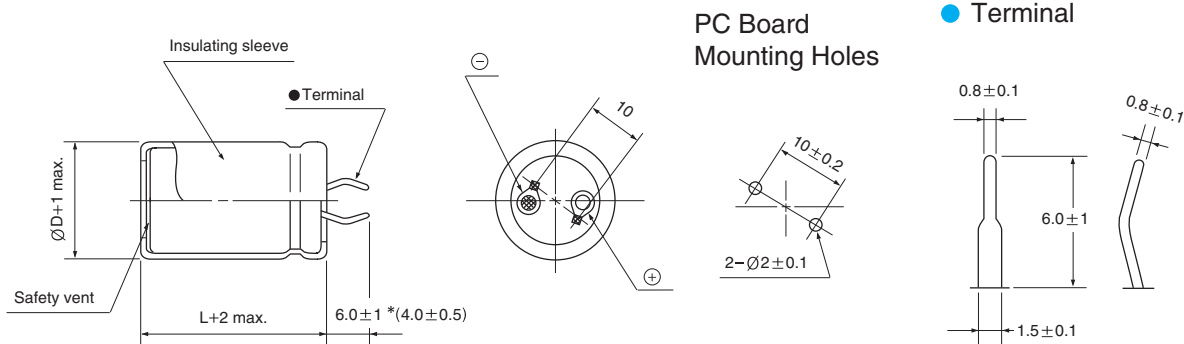
- Long life than HK series
- Load life of 5000 hours at 105°C
- Complied to the RoHS directive



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.															
	<table border="1"> <tr> <td>WV</td> <td>10</td> <td>16</td> <td>25, 35</td> <td>50, 63</td> <td>80, 100</td> <td>160 ~ 400</td> <td>450, 500</td> </tr> <tr> <td>tanδ</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </table>	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
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



\* 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(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
350 ~	0.85	1.00	1.15	1.20	1.40



# LARGE ALUMINUM ELECTROLYTIC CAPACITORS



## HL series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF / ØD	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 μF / ØD	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 μF / ØD	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			

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**HL** 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
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

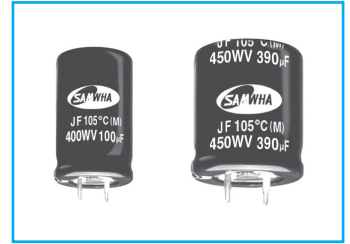
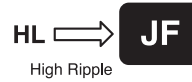
WV μF / ØD	350				400				450			
	22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
68	22×20 0.41	25.4×20 0.45			22×25 0.48	25.4×20 0.49			22×30 0.51	25.4×25 0.52		
82	22×25 0.48	25.4×20 0.49			22×25 0.52	25.4×25 0.58	30×20 0.59		22×30 0.56	25.4×25 0.58		
100	22×25 0.53	25.4×25 0.58	30×20 0.60		22×30 0.62	25.4×25 0.63	30×20 0.66		22×35 0.66	25.4×30 0.68	30×25 0.70	
120	22×30 0.62	25.4×25 0.64	30×20 0.65		22×35 0.72	25.4×25 0.70	30×25 0.77		22×40 0.75	25.4×30 0.74	30×25 0.77	35×25 0.83
150	22×35 0.74	25.4×30 0.76	30×25 0.78		22×40 0.85	25.4×30 0.83	30×25 0.85		22×45 0.89	25.4×40 0.93	30×30 0.91	35×25 0.93
180	22×40 0.85	25.4×30 0.83	30×25 0.86		22×45 0.97	25.4×35 0.96	30×30 1.00	35×25 1.02	22×50 1.02	25.4×40 1.02	30×30 1.00	35×25 1.02
220	22×45 0.98	25.4×35 0.98	30×30 1.00	35×25 1.03	22×50 1.13	25.4×40 1.13	30×30 1.10	35×25 1.13		25.4×45 1.17	30×35 1.16	35×25 1.13
270	22×50 1.14	25.4×40 1.14	30×30 1.11	35×25 1.14		25.4×45 1.30	30×35 1.28	35×30 1.32			30×40 1.35	35×30 1.30
330		25.4×45 1.31	30×35 1.30	35×30 1.33		25.4×50 1.50	30×40 1.49	35×30 1.46			30×45 1.56	35×35 1.50
390		25.4×50 1.49	30×40 1.48	35×35 1.52			30×45 1.69	35×35 1.67			30×50 1.77	35×40 1.74
470			30×45 1.69	35×35 1.67			30×50 1.93	35×40 1.91				
560			30×50 1.92	35×40 1.90								

WV μF / ØD	500			
	22	25.4	30	35
56	22×30 0.66	25.4×25 0.64		
68	22×30 0.73	25.4×25 0.72	30×25 0.70	
82	22×35 0.83	25.4×30 0.83	30×25 0.83	
100	22×40 0.94	25.4×35 0.94	30×25 0.91	35×25 0.85
120	22×50 1.08	25.4×35 1.02	30×30 1.04	35×25 1.01
150	22×55 1.24	25.4×45 1.21	30×35 1.19	35×30 1.18
180	22×60 1.38	25.4×50 1.36	30×40 1.34	35×30 1.25
220		25.4×55 1.52	30×45 1.51	35×40 1.51
270			30×50 1.69	35×40 1.62
330			30×55 1.89	35×45 1.81
390				35×55 2.08
470				35×60 2.28

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

## JF Long Life, High Ripple Series

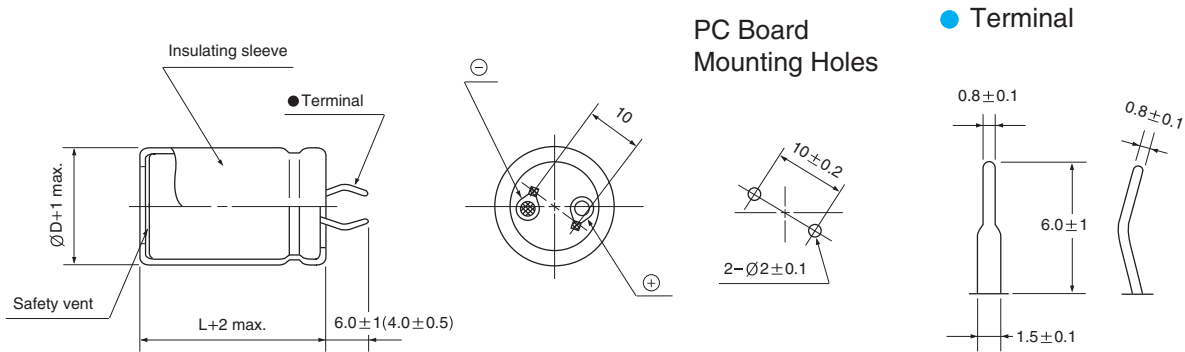
- Long life and high ripple than HL series
- Voltage range of 400 ~ 450V
- Load life of 5000 hours at 105°C
- Complied to the RoHS directive



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.	Capacitance > 1000µF : tanδ increases by 0.01 for each 1000µF from below value.		
	WV	400	450
	tanδ	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



\* 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 ≤
400, 450		0.85	1.00	1.15	1.20	1.40

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**JF** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF ∅D	400				450			
	22	25.4	30	35	22	25.4	30	35
56					22 × 20 0.53			
68	22 × 20 0.58				22 × 25 0.61	25.4 × 20 0.62		
82	22 × 25 0.62	25.4 × 20 0.69			22 × 25 0.67	25.4 × 25 0.69		
100	22 × 25 0.74	25.4 × 25 0.75			22 × 30 0.79	25.4 × 25 0.81	30 × 20 0.84	
120	22 × 30 0.86	25.4 × 25 0.84	30 × 20 0.92		22 × 35 0.90	25.4 × 30 0.89	30 × 25 0.92	35 × 20 0.99
150	22 × 35 1.02	25.4 × 30 0.99	30 × 25 1.02		22 × 40 1.06	25.4 × 35 1.11	30 × 25 1.09	35 × 25 1.11
180	22 × 40 1.16	25.4 × 30 1.15	30 × 25 1.20		22 × 45 1.22	25.4 × 35 1.22	30 × 30 1.20	35 × 25 1.22
220	22 × 45 1.35	25.4 × 35 1.35	30 × 30 1.32	35 × 25 1.35	22 × 50 1.35	25.4 × 45 1.40	30 × 35 1.39	35 × 30 1.35
270	22 × 50 1.58	25.4 × 40 1.56	30 × 35 1.53	35 × 30 1.58		25.4 × 50 1.54	30 × 40 1.62	35 × 30 1.56
330		25.4 × 50 1.80	30 × 35 1.78	35 × 30 1.75			30 × 45 2.03	35 × 35 1.80
390			30 × 40 2.02	35 × 35 2.00			30 × 50 2.12	35 × 40 2.08
470			30 × 50 2.31	35 × 40 2.29	← Case size ∅D × L (mm) ← Ripple current (A rms) at 105°C, 120Hz			

## HY Snap-in Terminal Type, Long Life Series

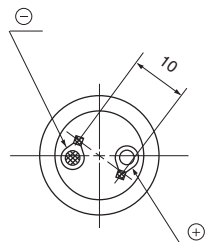
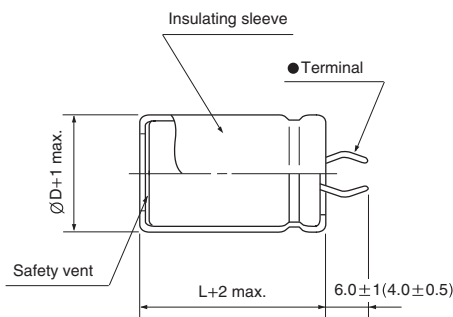
- Load life of 7000 hours at 105°C
- Voltage range of 160 ~ 500V
- Suited for use in industrial power supplies where high reliability
- Complied to the RoHS directive



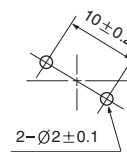
Item	Characteristics															
Operating temperature range	WV < 350: -40 ~ +105°C, WV ≥ 350: -25 ~ +105°C															
Capacitance tolerance	±20% at 120Hz, 20°C															
Leakage current max.	$I = 3\sqrt{CV}$ (µA) (after 5 minutes)															
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000µF : tanδ increases by 0.01 for each 1000µF from below value.															
	<table border="1"> <thead> <tr> <th>WV</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> <th>500</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </tbody> </table>	WV	160	200	250	350	400	450	500	tanδ	0.15	0.15	0.15	0.15	0.15	0.20
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

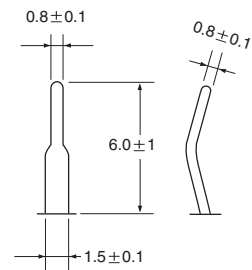
Unit : mm



### 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 μF ∅D	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 μF ∅D	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 μF ∅D	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 ∅D×L (mm)  
← Ripple current (Arms) at 105°C, 120Hz

## JY Snap-in Terminal Type, Long Life Series

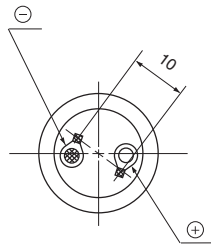
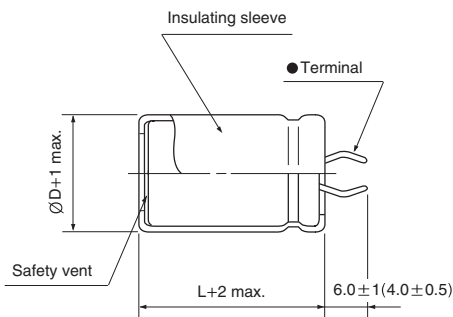
- Load life of 10000 hours at 105°C
- Voltage range of 400 ~ 450V
- Suited for use in industrial power supplies where high reliability
- Complied to the RoHS directive



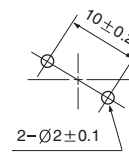
Item	Characteristics		
Operating temperature range	-25 ~ +105°C		
Capacitance tolerance	±20% at 120Hz, 20°C		
Leakage current max.	$I=3\sqrt{CV}$ (µA) (after 5 minutes)		
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000µF : tanδ increases by 0.01 for each 1000µF from below value.		
	WV	400	450
	tanδ	0.15	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

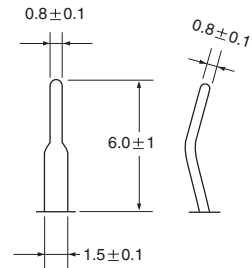
Unit : mm



### 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 ≤
Coefficient	0.85	1.00	1.15	1.20	1.40

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**JY** series

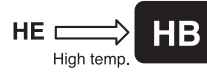
## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF ØD	400				450			
	22	25.4	30	35	22	25.4	30	35
47					22 × 25 0.38			
56	22 × 20 0.39				22 × 30 0.45	25.4 × 20 0.43		
68	22 × 25 0.46	25.4 × 20 0.48			22 × 30 0.52	25.4 × 25 0.51		
82	22 × 30 0.54	25.4 × 25 0.53			22 × 35 0.60	25.4 × 30 0.59	30 × 20 0.57	
100	22 × 30 0.60	25.4 × 25 0.62			22 × 40 0.69	25.4 × 30 0.69	30 × 25 0.67	
120	22 × 35 0.69	25.4 × 30 0.72	30 × 25 0.69			25.4 × 35 0.79	30 × 30 0.74	
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
180		25.4 × 35 0.97	30 × 30 0.95	35 × 25 0.92			30 × 35 1.04	35 × 30 1.03
220		25.4 × 40 1.11	30 × 35 1.11	35 × 25 1.08			30 × 40 1.20	35 × 35 1.19
270			30 × 40 1.28	35 × 30 1.26				35 × 40 1.37
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			



## HB High Temperature Range, For 125°C Use Series

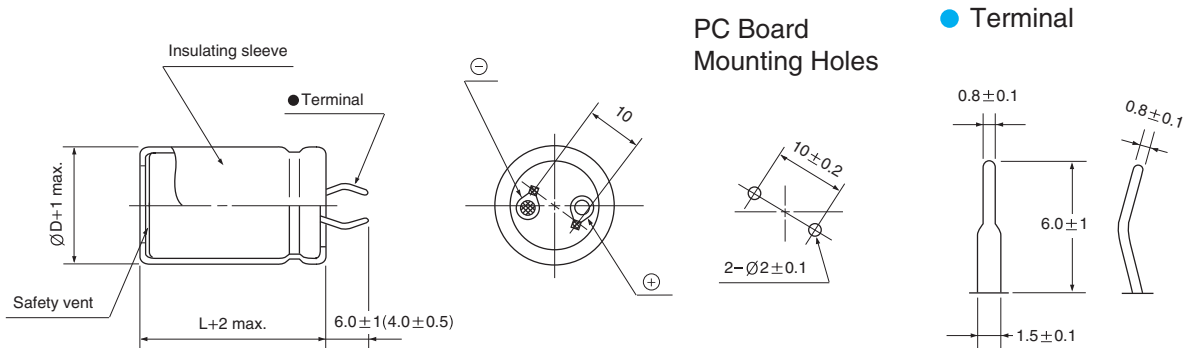
- Wide operating temperature range of -40 ~ +125°C
- With a guaranteed useful life of 10 years at 60°C
- Ideal for industrial applications requiring continuous operation
- Complied to the RoHS directive



Item	Characteristics															
Operating temperature range	-40 ~ +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.															
	<table border="1"> <thead> <tr> <th>WV</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50, 63</th> <th>80 ~ 160</th> <th>200, 250</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.17</td> <td>0.15</td> </tr> </tbody> </table>	WV	10	16	25	35	50, 63	80 ~ 160	200, 250	tanδ	0.50	0.40	0.30	0.25	0.20	0.17
WV	10	16	25	35	50, 63	80 ~ 160	200, 250									
tanδ	0.50	0.40	0.30	0.25	0.20	0.17	0.15									
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														
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



\* 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 ~	0.85	1.00	1.20	1.25	1.45

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**HB** series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF / ØD	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 μF / ØD	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 μF / ØD	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								

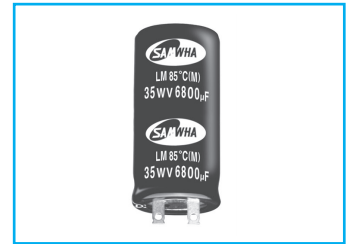
WV μF / ØD	200				250			
	22	25.4	30	35	22	25.4	30	35
100					22×30 0.32			
150	22×35 0.42				22×40 0.44	25.4×30 0.43		
220	22×45 0.56	25.4×40 0.58	30×30 0.57		22×50 0.58	25.4×40 0.58	30×35 0.60	35×30 0.61
330		25.4×50 0.77	30×40 0.77	35×30 0.75			30×45 0.80	35×35 0.79
470			30×50 0.99	35×40 0.98				35×45 1.03
680				35×50 1.28				

← Case size ØD×L (mm)  
← Ripple current (A rms) at 125°C, 120Hz

## LM Lug Terminal Type Series

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

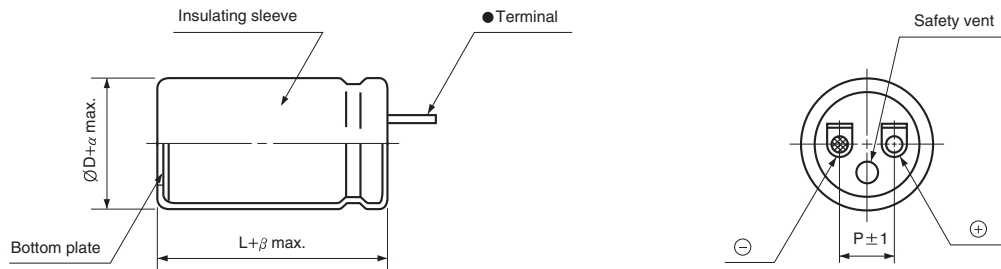
**S**  
Solvent Proof  
WV ≤ 100V



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.											
	<table border="1"> <thead> <tr> <th>WV</th> <th>16</th> <th>25</th> <th>35~63</th> <th>80~350</th> <th>400~450</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.25</td> </tr> </tbody> </table>	WV	16	25	35~63	80~350	400~450	tanδ	0.35	0.30	0.25	0.20
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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**LM** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \diagdown WV	16		25		35		40		50	
3300							25.4×30	2.46	25.4×30	2.46
4700					25.4×30	2.89	25.4×40	3.21	25.4×40	3.21
6800			25.4×30	3.12	25.4×40	3.73	25.4×50	4.07	25.4×50	4.07
10000	25.4×30	3.42	25.4×40	4.03	25.4×50	4.71	25.4×60	5.07	30×50	5.08
15000	25.4×40	4.41	25.4×50	5.07	30×50	5.81	30×60	6.24	35×60	6.67
22000	25.4×50	5.44	30×50	6.15	35×60	7.44	35×60	7.44	35×80	8.34
33000	30×50	6.57	35×60	7.85	35×80	9.18	35×80	9.18	40×100	10.6
47000	35×60	8.19	35×80	9.49	40×100	11.3	51×105	12.5	51×105	12.5
68000	35×80	9.85	40×100	11.6	51×105	13.2				
100000	40×100	12.0	51×105	13.5						
150000	51×105	13.9								

$\mu\text{F}$ \diagdown WV	63		80		100		160		200	
330							25.4×30	0.92	25.4×30	0.92
470							25.4×40	1.22	25.4×40	1.22
680							25.4×50	1.60	25.4×50	1.60
1000					25.4×30	1.60	25.4×60	2.09	30×50	2.09
1500			25.4×30	1.92	25.4×40	2.13	30×60	2.69	35×60	2.87
2200	25.4×30	2.05	25.4×40	2.52	25.4×50	2.75	35×60	3.40	35×80	3.81
3300	25.4×40	2.73	25.4×50	3.29	30×50	3.55	35×100	5.02	40×100	5.27
4700	25.4×50	3.50	25.4×60	4.14	35×60	4.76	40×100	6.15	51×105	6.80
6800	25.4×60	4.38	30×60	5.15	35×80	6.17	51×105	7.86		
10000	30×60	5.46	35×80	7.08	40×100	8.16				
15000	35×80	7.48	40×80	8.43	51×105	10.2				
22000	35×100	9.16	51×105	11.3						
33000	51×105	11.7								

$\mu\text{F}$ \diagdown WV	250		315		350		400		450	
68									25.4×30	0.37
100					25.4×30	0.51	25.4×30	0.45	25.4×40	0.50
150			25.4×30	0.62	25.4×40	0.69	25.4×40	0.62	25.4×50	0.67
220	25.4×30	0.75	25.4×40	0.84	25.4×50	0.91	25.4×50	0.81	30×50	0.88
330	25.4×40	1.02	25.4×50	1.12	25.4×60	1.20	30×60	1.16	35×60	1.24
470	25.4×50	1.33	25.4×60	1.43	30×60	1.54	35×60	1.47	35×80	1.65
680	30×50	1.73	30×60	1.86	35×60	1.98	35×80	1.99	35×100	2.18
1000	30×60	2.25	35×70	2.56	35×100	2.96	40×100	2.78	51×80	2.77
1500	35×80	3.22	35×100	3.54	40×100	3.72	51×105	3.69		
2200	35×100	4.19	40×100	4.40	51×105	4.86	← Ripple current (A rms) at 85°C, 120Hz			
3300	51×80	5.24	51×105	5.82			← Case size $\varnothing D \times L$ (mm)			

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS



Upgrade

## 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

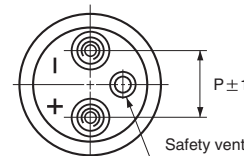
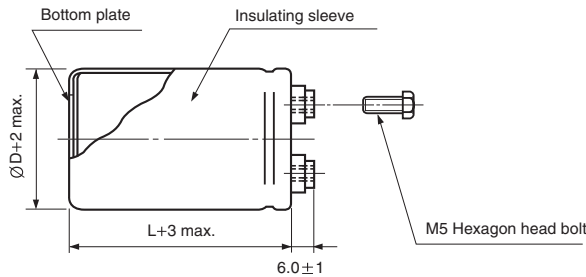
**GT** → **CU**  
Wide Temp.



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.	$I = 3\sqrt{CV}$ (µA) (after 5 minutes)																																																												
Dissipation factor max. (at 120Hz, 20°C)	<table border="1"> <thead> <tr> <th>∅D \ WV</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160 ~ 250</th> <th>350 ~ 500</th> </tr> </thead> <tbody> <tr> <td>35</td> <td>0.70</td> <td>0.45</td> <td>0.45</td> <td>0.30</td> <td>0.25</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.25</td> </tr> <tr> <td>51</td> <td>1.00</td> <td>0.60</td> <td>0.60</td> <td>0.45</td> <td>0.35</td> <td>0.30</td> <td>0.20</td> <td>0.15</td> <td>0.25</td> </tr> <tr> <td>63.5</td> <td>1.30</td> <td>0.80</td> <td>0.70</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.25</td> </tr> <tr> <td>76.2</td> <td>2.00</td> <td>1.60</td> <td>0.90</td> <td>0.70</td> <td>0.50</td> <td>0.45</td> <td>0.35</td> <td>0.25</td> <td>0.25</td> </tr> <tr> <td>89</td> <td>2.50</td> <td>2.40</td> <td>1.00</td> <td>0.80</td> <td>0.60</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> </tr> </tbody> </table>	∅D \ 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
	∅D \ 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																																																												

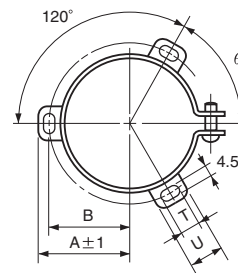
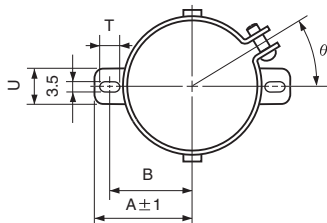
### DRAWING

Unit : mm



### TWO LEGS ANGLE

### THREE LEGS ANGLE



### TWO LEGS ANGLE SIZE TABLE

∅D	B	A	T	U	θ°	P
35	24	29	7	10	30	12.7
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### THREE LEGS ANGLE SIZE TABLE

∅D	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**GT** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \diagdown WV	16		25		35		50	
10000							35×60	6.2
15000					35×50	5.8	35×80	8.5
22000			35×60	7.5	35×68	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	76.2×160	37.9		
470000	76.2×120	27.1	76.2×160	39.2				
680000	76.2×160	36.5						

$\mu\text{F}$ \diagdown WV	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						

$\mu\text{F}$ \diagdown WV	200		250	
330				
470				
680			35×50	2.1
1000	35×60	2.8	35×68	2.9
1500	35×68	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  $\varnothing D \times L$  (mm)

## GT series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	350			400			450		
	∅D×L (mm)	Ripple current (A rms)		∅D×L (mm)	Ripple current (A rms)		∅D×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	1.2
330	35×50	3.7	1.3	35×60	3.9	1.4	35×80	4.4	1.5
390	35×60	4.3	1.5	35×60	4.3	1.5	35×80	4.8	1.7
470	35×60	4.7	1.6	35×80	5.3	1.8	35×100	5.8	2.0
560	35×80	5.8	2.0	35×100	6.3	2.2	35×100	6.3	2.2
680	35×80	6.4	2.2	35×100	7.0	2.4	35×120	7.5	2.6
820	35×100	7.7	2.7	35×120	8.3	2.9	51×80	8.0	2.8
1000	35×120	9.2	3.2	51×80	8.8	3.1	51×80	9.6	3.4
1200	51×80	9.7	3.4	51×80	9.7	3.4	51×100	10.6	3.7
1500	51×80	10.8	3.8	51×100	11.8	4.1	51×100	12.7	4.4
1800	51×100	12.9	4.5	51×100	13.9	4.9	51×110	13.8	4.8
2200	51×120	15.4	5.4	51×120	16.4	5.7	51×120	16.3	5.7
2700	51×140	18.2	6.4	63.5×100	18.1	6.3	51×140	19.2	6.7
3300	51×130	20.4	6.8	51×140	22.8	7.6	51×140	20.3	7.1
	63.5×120	20.0	7.0	63.5×120	21.3	7.4	63.5×120	20.6	7.2
3900	63.5×140	23.1	8.1	63.5×130	24.4	8.6	63.5×130	23.7	8.3
				76.2×100	24.4	8.6	76.2×100	23.5	8.2
4700	63.5×160	26.8	9.4	63.5×160	26.9	9.4	63.5×160	27.8	9.7
	76.2×120	26.4	8.8	76.2×120	26.0	9.1	76.2×120	27.5	9.6
5600	76.2×140	28.4	10.0	76.2×130	30.0	10.5	76.2×130	31.3	10.9
6800	76.2×160	33.0	11.6	76.2×140	34.5	12.1	76.2×140	33.8	12.1
	89×120	32.5	11.4	89×120	34.5	12.1	89×130	33.5	12.0
8200	76×190	38.4	13.6	76.2×160	39.8	13.9	76.2×160	42.8	15.3
	89×140	37.8	13.2	89×130	39.8	13.9	89×140	42.8	15.3
10000	89×160	44.0	15.4	89×140	44.0	15.4	89×160	49.8	17.8
12000	89×160	47.3	16.9	89×160	47.6	17.0	89×190	58.5	20.9
15000	89×190	56.6	20.2	89×190	57.4	20.5			

WV Item μF	500		
	∅D×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	7.5
3300	76.2×140	26.1	8.8
3900	76.2×160	27.2	9.7
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

## GM Screw Terminal Type, High Ripple Series

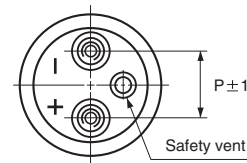
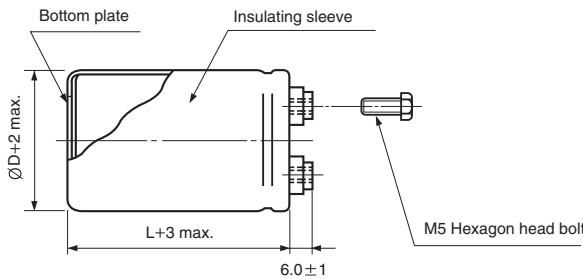
- Ideally suited for use as input and output filter capacitors in power supplies
- High ripple current compared with GT series
- Suited for smoothing circuits for general purpose inverters, control circuits for F.A. machines and medical equipment
- Designed for use as input filter capacitor for current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



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	

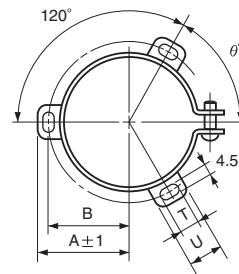
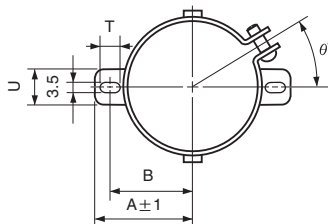
### ● DRAWING

Unit : mm



### ● TWO LEGS ANGLE

### ● THREE LEGS ANGLE



### ● TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### ● THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8



## GM series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	350		400		450	
	∅D×L (mm)	Ripple current (A rms) 85°C 120Hz	∅D×L (mm)	Ripple current (A rms) 85°C 120Hz	∅D×L (mm)	Ripple current (A rms) 85°C 120Hz
820					51 × 80	4.8
1000			51 × 80	5.3	51 × 100	5.8
1200	51 × 80	5.8	51 × 80	5.8	51 × 100	6.3
1500	51 × 80	6.5	51 × 100	7.0	51 × 120	7.5
1800	51 × 100	7.7	51 × 120	8.3	51 × 140	8.2
2200	51 × 120	9.2	51 × 140	9.7	63.5 × 100	8.9
2700	51 × 140	10.9	63.5 × 100	10.0	63.5 × 120	10.4
3300	63.5 × 100	11.0	63.5 × 120	11.6	63.5 × 130	11.7
3900	63.5 × 120	13.0	63.5 × 130	13.2	76.2 × 120	13.4
4700	63.5 × 130	14.5	76.2 × 120	14.7	76.2 × 130	15.5
5600	76.2 × 120	15.5	76.2 × 130	16.1	76.2 × 160	17.2
6800	76.2 × 130	17.8	76.2 × 160	19.0	76.2 × 170	19.4
8200	76.2 × 160	21.1	76.2 × 170	21.4		
10000	76.2 × 170	23.8	89 × 160	25.0		

### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.3	1.4

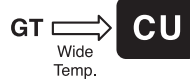
# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

Upgrade



Screw Terminal Type, Wide Temperature Range Series

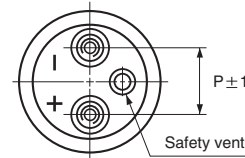
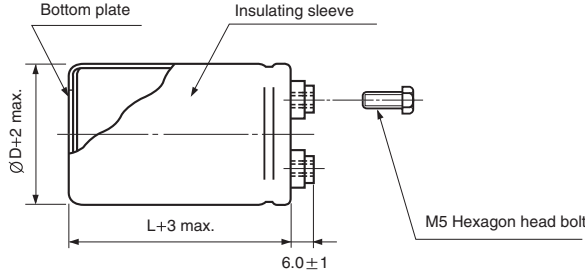
- Screw terminal series for high temperature up to 105°C
- High ripple current capability
- Ideally suited for use as input and output filter capacitors in power supplies
- Complied to the RoHS directive



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)	$\frac{\text{WV}}{\text{ØD}}$	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	

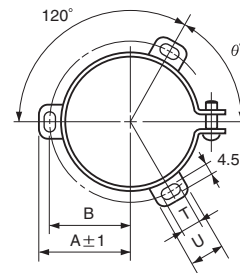
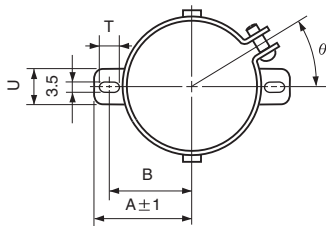
## DRAWING

Unit : mm



### TWO LEGS ANGLE

### THREE LEGS ANGLE



### TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
35	24	29	7	10	30	12.7
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

## CU series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \diagdown WV	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	35×68	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	76.2×160	24.6				
470000	76.2×160	25.5						

$\mu\text{F}$ \diagdown WV	63		80		100		160	
1000							35×60	1.7
1500					35×60	1.9	35×68	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  $\varnothing D \times L$  (mm)

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**CU** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \diagdown WV	200		250		350		400	
	1000	35×68	1.8	35×80	2.1	35×100	3.4	51×70
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		

$\mu\text{F}$ \diagdown WV	450		500	
	2200	63.5×100	6.7	63.5×130
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  $\varnothing D \times L$  (mm)

## ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

WV \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz $\leq$
~ 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



Upgrade

# GF

For Inverter Circuits Series

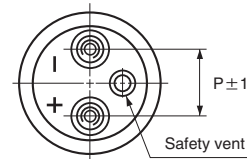
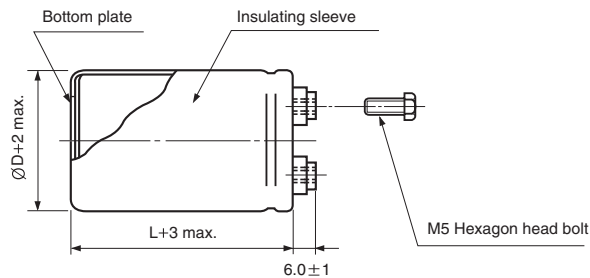


- Screw terminal series in compact case size
- High reliability, long life guaranteed for 5000 hours load life at 85°C
- Suited for use in industrial power supplies for inverters
- Complied to the RoHS directive

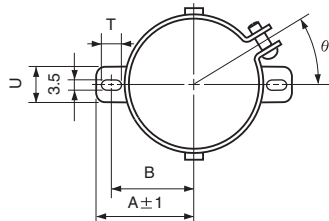
Item	Characteristics	
Operating temperature range	-25 ~ +85°C	
Capacitance tolerance	±20% at 120Hz, 20°C	
Leakage current max.	$I=3\sqrt{CV}$ (μA) (after 5 minutes)	
Dissipation factor max.	0.25 max. at 120Hz, 20°C	
Load life (after application of the rated voltage for 5000 hours at 85°C)	Leakage current	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

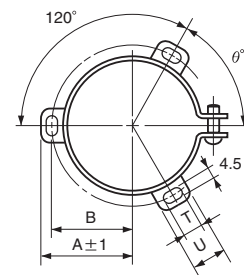
Unit : mm



### TWO LEGS ANGLE



### THREE LEGS ANGLE



### TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
35	24	29	7	10	30	12.7
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**GF** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	350			400			450		
	∅D×L (mm)	Ripple current (A rms)		∅D×L (mm)	Ripple current (A rms)		∅D×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		
	∅D×L (mm)	Ripple current (A rms)		∅D×L (mm)	Ripple current (A rms)		∅D×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

Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.1	1.3	1.4

## GQ For Inverter, High Ripple Series

- High ripple current compared with GF series
- 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

**LL**  
Long Life

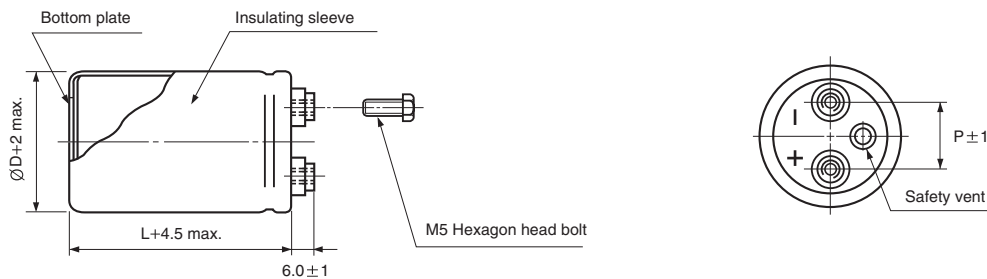


GF → **GQ**  
High Ripple

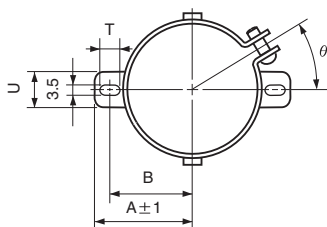
Item	Characteristics	
Operating temperature range	-25 ~ +85°C	
Capacitance tolerance	±20% at 120Hz, 20°C	
Leakage current max.	$I=3\sqrt{CV}$ (μA) (after 5 minutes)	
Dissipation factor max.	0.25 max. at 120Hz, 20°C	
Load life (after application of the rated voltage for 5000 hours at 85°C)	Leakage current	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

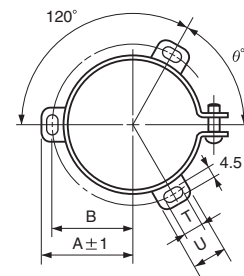
Unit : mm



### ● TWO LEGS ANGLE



### ● THREE LEGS ANGLE



### ● TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### ● THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**GQ** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \diagdown WV	400		450	
1800				
2200	51 × 100	10.9	51 × 120	7.3
2700	51 × 110	13.0	63.5 × 100	13.7
3300	63.5 × 100	15.1	63.5 × 110	15.5
3900	63.5 × 110	16.0	76.2 × 100	18.1
4700	63.5 × 130	18.9	76.2 × 110	20.2
5600	76.2 × 110	21.5	76.2 × 130	20.7
6800	76.2 × 130	22.8	76.2 × 150	23.9
8200	76.2 × 150	24.3	89 × 140	25.6
10000	89 × 140	26.7		
12000	89 × 150	27.3		

Ripple current (A rms) at 85°C, 120Hz  
 Case size  $\varnothing D \times L$  (mm)

## ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.1	1.3	1.4



## GL Screw Terminal Type, Long Life Series



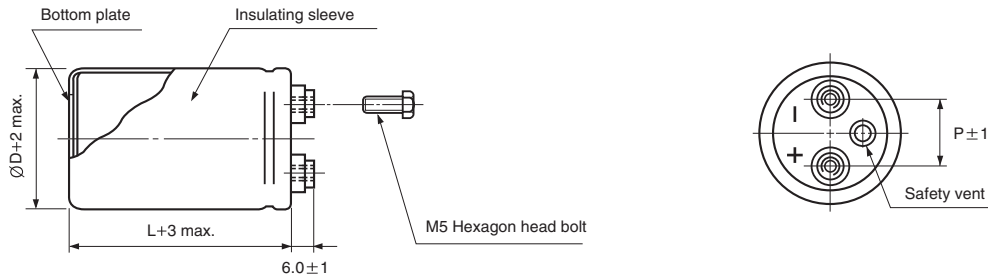
- Screw terminal series in compact case size
- High reliability, long life guaranteed for 20000 hours load life at 85°C
- Suited for use in industrial power supplies for inverters
- Complied to the RoHS directive



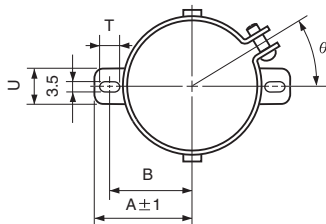
Item	Characteristics	
Operating temperature range	-25 ~ +85°C	
Capacitance tolerance	±20% at 120Hz, 20°C	
Leakage current max.	$I=3\sqrt{CV}$ (µA) (after 5 minutes)	
Dissipation factor max.	0.25 max. at 120Hz, 20°C	
Load life (after application of the rated voltage for 20000 hours at 85°C)	Leakage current	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

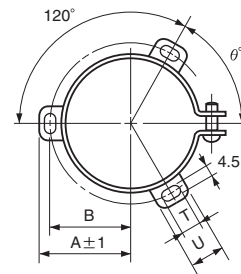
Unit : mm



### TWO LEGS ANGLE



### THREE LEGS ANGLE



### TWO LEGS ANGLE SIZE TABLE

∅D	B	A	T	U	θ°	P
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### THREE LEGS ANGLE SIZE TABLE

∅D	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**GL** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item $\mu\text{F}$	350		400		450	
	$\varnothing\text{D} \times \text{L}$ (mm)	Ripple current (A rms) 85°C 120Hz	$\varnothing\text{D} \times \text{L}$ (mm)	Ripple current (A rms) 85°C 120Hz	$\varnothing\text{D} \times \text{L}$ (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	12.9
3900	63.5 × 110	12.5	76.2 × 100	13.9	76.2 × 130	14.6
4700	76.2 × 100	14.0	76.2 × 130	16.0	76.2 × 150	16.9
5600	76.2 × 110	16.4	76.2 × 150	18.3	76.2 × 160	19.4
6800	76.2 × 130	19.1	76.2 × 160	21.2	89 × 150	21.6
8200	76.2 × 150	21.4	89 × 150	23.7	89 × 160	25.4
10000	89 × 150	25.3	89 × 160	28.0		
12000	89 × 160	28.8				

## ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.1	1.3	1.4

## EV High ripple Current, High Reliability Series

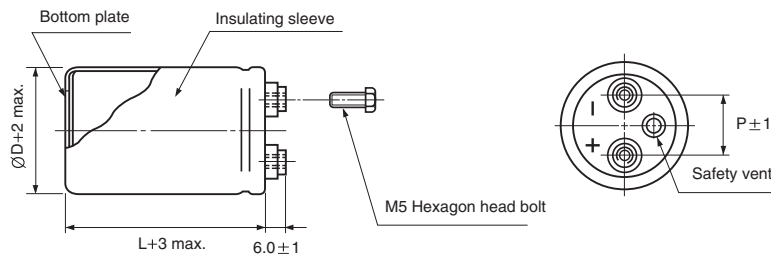
- High ripple current compared with CU series
- Long life guaranteed for 5000 hours load life at 105°C
- Suited for the general-purpose inverter
- Complied to the RoHS directive



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

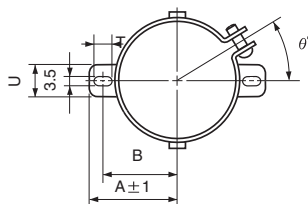
Unit : mm



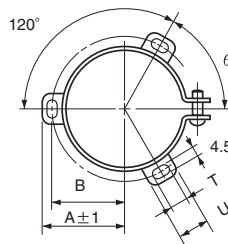
### ● TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

### ● TWO LEGS ANGLE



### ● THREE LEGS ANGLE



### ● THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

### ● 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	7.5
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	12.3
3300	63.5 × 130	16.1	76.2 × 130	16.9	76.2 × 150	13.0
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	25.2		
6800	89 × 150	27.1	89 × 150	26.0		

### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.1	1.3	1.4

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**EY** High Ripple, High Reliability Long Life Series



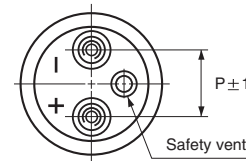
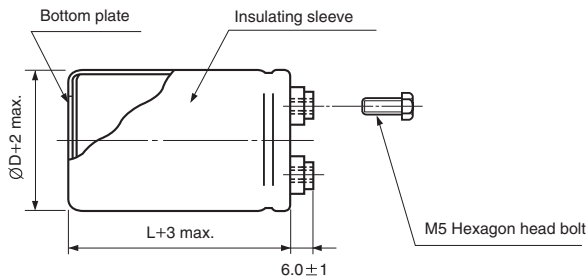
- High ripple current compared with EV Series
- High reliability, long life guaranteed for 7000 hours load life at 105°C
- Suited for use in industrial power supplies for inverter
- Complied to the RoHS directive



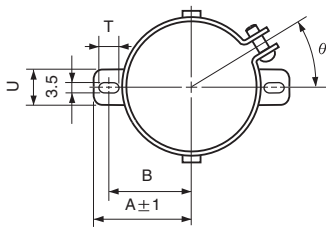
Item	Characteristics	
Operating temperature range	-25 ~ +105°C	
Capacitance tolerance	±20% at 120Hz, 20°C	
Leakage current max.	$I=3\sqrt{CV}$ (μA) (after 5 minutes)	
Dissipation factor max.	0.20 max. at 120Hz, 20°C	
Load life (after application of the rated voltage for 7000 hours at 105°C)	Leakage current	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

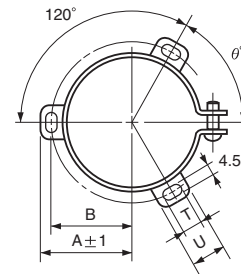
Unit : mm



● TWO LEGS ANGLE



● THREE LEGS ANGLE



● TWO LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	33.6	39.9	6	14	30	22
63.5	40.8	46.8	6	14	30	28.6

● THREE LEGS ANGLE SIZE TABLE

ØD	B	A	T	U	θ°	P
51	32.9	38.9	7	12	60	22
63.5	38.4	45.3	7	14	60	28.6
76.2	44.5	51.5	8	16	60	31.8
89	50.8	61	8	16	60	31.8

## EY series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item $\mu F$	350		400		450	
	$\varnothing D \times L$ (mm)	Ripple current (A rms) 105°C 120Hz	$\varnothing D \times L$ (mm)	Ripple current (A rms) 105°C 120Hz	$\varnothing D \times L$ (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				

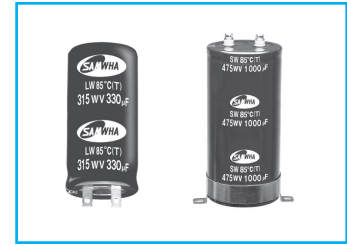
### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	3kHz
Coefficient	0.8	1.0	1.1	1.3	1.4

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## 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

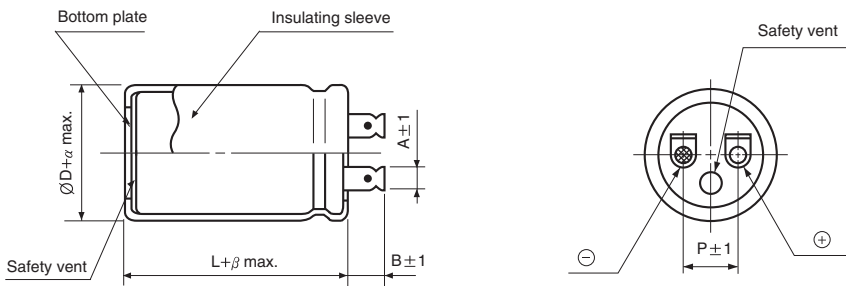


Item	Characteristics	
Operating temperature range	-25 ~ +85°C	
Capacitance tolerance	-10 ~ +50% at 120Hz, 20°C (Capacitance Tolerance "T")	
Leakage current max.	$I=3\sqrt{CV}$ ( $\mu A$ ) (after 5 minutes)	
Dissipation factor max.	0.20 max.at 120Hz, 20°C	
Charge and discharge characteristics	After charge 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 $\pm 15\%$ of initial value
	$\tan\delta$	Less than 150% of specified value
Conditions		
Charge resistance : 4Ω      Charge time : 1 sec		
Discharge resistance : 0.12Ω      Discharge time : 0.5sec		

### DRAWING

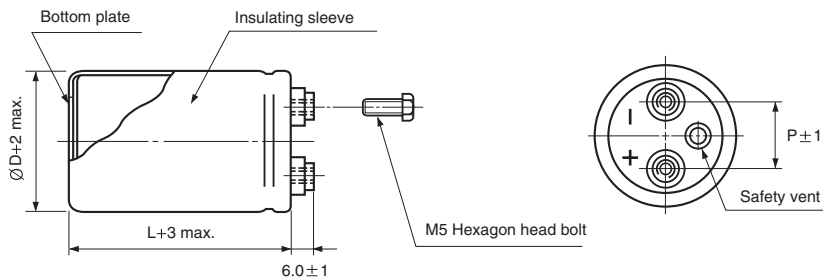
Unit : mm

#### LW series



$\varnothing D$	35	51
P	14	18
$\alpha$	1	2
$\beta$	2	3
A	4.5	8
B	8	13

#### SW series



$\varnothing D$	35	51	63.5	76.2
P	12.7	22	28.6	31.8

### DIMENSIONS

$\varnothing D \times L$  (mm)

$\mu F$	WV SERIES	315		475	
		LW	SW	LW	SW
225				51 × 100	51 × 100
330		35 × 100			
470		51 × 100			76.2 × 120
1000			63.5 × 140		76.2 × 160
1500			76.2 × 120		
2200			76.2 × 160		

## AM For Hi-Fi Component System Series

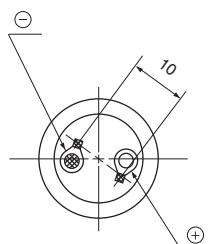
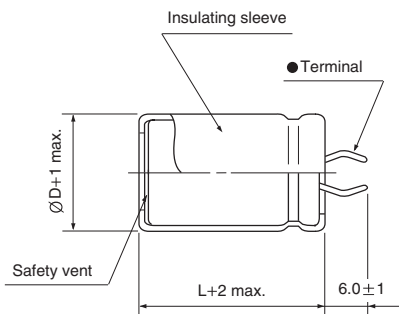


- For high grade audio equipment
- High resonance frequency, low ESR and low impedance
- For AMP, AVR
- Snap-in terminal type
- Voltage range of 16~100V
- Complied to the RoHS directive

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				

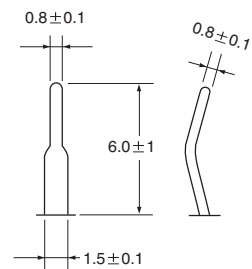
### ● DRAWING

Unit : mm



### PC Board Mounting Holes

### ● Terminal



# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**AM** series

● DIMENSIONS

∅D×L(mm)

$\mu\text{F}$ \ WV	16	25	35	50	63	80	100
470							22 × 40
680						22 × 40	25.4 × 40
1000					22 × 40	25.4 × 40	25.4 × 50
1500				22 × 40	25.4 × 40	25.4 × 50	30 × 50
2200			22 × 40	25.4 × 40	25.4 × 50	30 × 50	35 × 50
3300		22 × 40	25.4 × 40	25.4 × 50	30 × 50	30 × 60	35 × 60
4700		25.4 × 40	25.4 × 50	30 × 50	30 × 60	35 × 60	
6800	22 × 40	25.4 × 50	30 × 50	30 × 60	35 × 60		
8200	25.4 × 40	30 × 50	35 × 50	35 × 60	35 × 60		
10000	25.4 × 50	35 × 50	35 × 60	35 × 60			
12000	30 × 50	35 × 50	35 × 60				
15000	35 × 50	35 × 60					
22000	35 × 60						
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

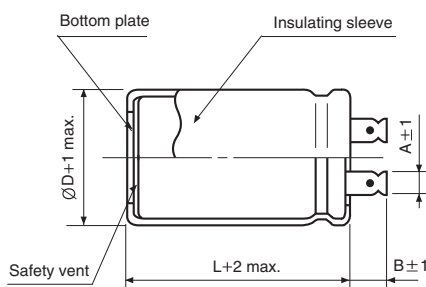


Item	Characteristics		
Operating temperature range	-20 ~ +55°C		
Capacitance tolerance	-10 ~ +20% at 120Hz, 20°C		
Leakage current max.	$I=1 \times C$ ( $\mu$ A) (after 5 minutes), where C=Nominal capacitance ( $\mu$ F)		
Dissipation factor max. (at 120Hz, 20°C)	Capacitance range( $\mu$ F)	150 ~ 600	700 ~ 1500
	$\tan\delta$	0.10	0.15
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 0.7~1.0 $\Omega$		
	Leakage current	Less than 150% of specified value	
	Capacitance change	Within $\pm 10\%$ of initial 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 $\pm 10\%$ of initial value	
	$\tan\delta$	Less than 150% of specified value	

### DRAWING

Unit : mm

#### • $\varnothing D \geq 22$



	$\varnothing D=22$	$\varnothing D \geq 25.4$	$\varnothing D=40$ *
A	3.5	4.5	4.5
B	6.0	8.0	11.0
p	8.0	10.0	18.0

\* Note :  $\varnothing 40$  is available upon request. Please check with us individual size and dimensions.

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## DF series

### ● DIMENSIONS

∅D×L(mm)

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

# AR,AG For Inverter Air-conditionings

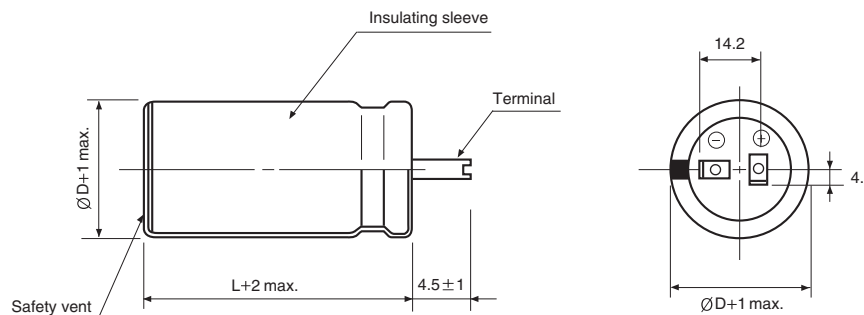
- For high ripple current application such as air conditioning system
- AG, AR series is load life of 3000 hours at 85°C



Item	Characteristics		
Operating temperature range	AR : -25 ~ +85°C		AG : -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	400	450
	tanδ	0.15	0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV	400	450
	Z-25°C / Z+20°C	4	8
	Z-40°C / Z+20°C	8	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 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 leaving capacitors under no load at 85°C for 1000 hours. The measurement shall be performed at 20°C by the KS C 60384 - 4.		

● DRAWING

Unit : mm



WV	SERIES µF / ØD	AR		AG	
		30	35	30	35
400	560	30 × 55 2.80	35 × 45 2.70		
	680	30 × 60 3.20	35 × 50 3.10	30 × 60 4.00	35 × 50 4.00
	820	30 × 70 4.00	35 × 60 4.00	30 × 70 4.50	35 × 60 4.50
	1000		35 × 70 5.00		
450	560	30 × 60 2.70	35 × 50 2.60		35 × 50 4.00
	680	30 × 70 3.10	35 × 60 3.00	30 × 70 4.40	35 × 60 4.40
	820		35 × 70 4.00	← Case size ØD × L (mm)	35 × 70 4.80

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

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

## AL For Inverter Air-conditionings

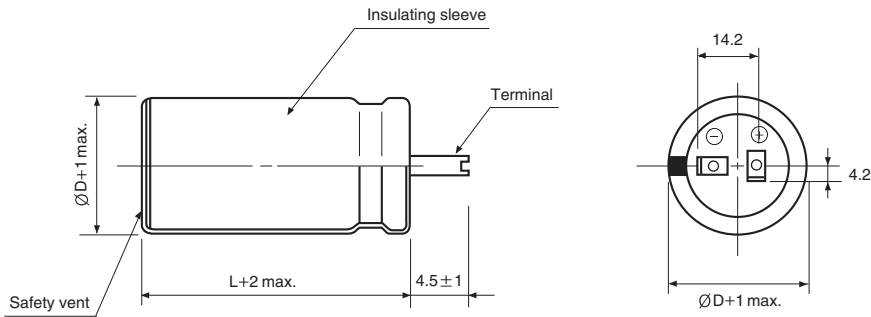
- For high ripple current application such as air conditioning system
- AL series is load life of 5000 hours at 85°C



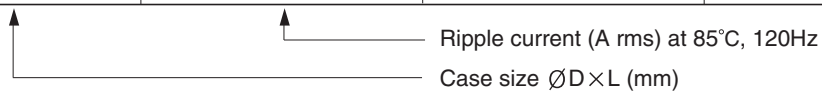
Item	Characteristics	
Operating temperature range	-40 ~ +85°C	
Capacitance tolerance	± 10% at 120Hz, 20°C	
Leakage current max.	$I=3 \sqrt{CV}$ (µA) (after 5 minutes)	
Dissipation factor (120Hz, 20°C)	WV	450
	tanδ	0.20
Low temperature characteristics (Impedance ratio at 120Hz)	Z-25°C / Z+20°C	8
	Z-40°C / 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 85°C	
	Leakage current	Less than specified value
	Capacitance change	Within ± 20% of initial 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



WV	µF	30		35	
		Case size	Ripple current	Case size	Ripple current
450	560	30 × 60	3.12	35 × 50	3.12
	680	30 × 70	4.00	35 × 60	4.00
	820			35 × 70	4.80



## 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

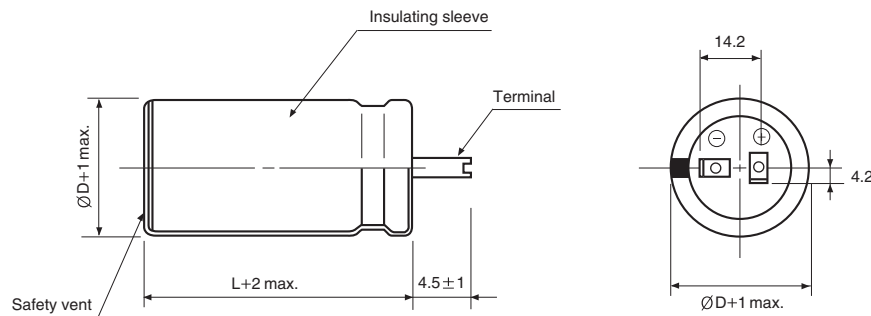
AR  $\Rightarrow$  **AK**  
Wide temp.



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)	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
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)

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

New

# AJ

For Inverter Air-conditionings

- For high ripple current application such as air conditioning system
- AJ series is load life of 5000 hours at 105°C

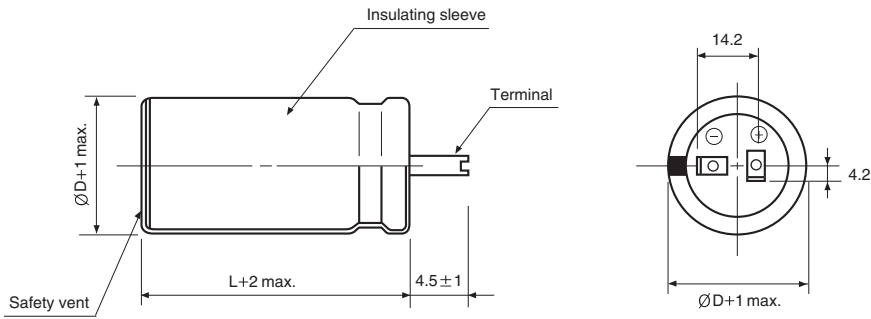


AK  $\Rightarrow$  AJ  
Long life

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)	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
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	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)