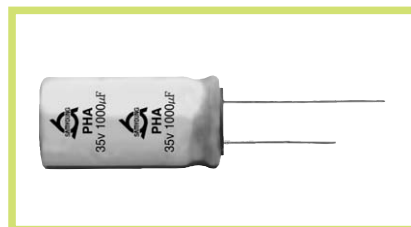
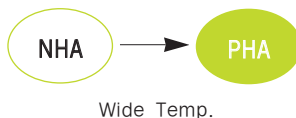


## PHA Series

• 150°C 1,000Hrs assured.

Solvent-proof

- Wide Temperature range.
- For ECU, Cooling fan
- RoHS compliant.
- Halogen-free capacitors are also available.



### SPECIFICATIONS

Item	Characteristics												
Rated Voltage Range	10 ~ 50 V <sub>DC</sub>												
Operating Temperature Range	-40 ~ +150°C												
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)												
Leakage Current	$I = 0.03CV (\mu A) \text{ or } 4\mu A$ , whichever is greater. Where, I: Max. leakage current( $\mu A$ ) C: Nominal capacitance( $\mu F$ ) V: Rated voltage(V <sub>DC</sub> ) (at 20°C, 1 minute)												
Dissipation Factor (Tan $\delta$ )	<table border="1"> <tr> <td>Rated Voltage(V<sub>DC</sub>)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan<math>\delta</math>(Max.)</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table> (at 20°C, 120Hz)	Rated Voltage(V <sub>DC</sub> )	10	16	25	35	50	Tan $\delta$ (Max.)	0.24	0.20	0.16	0.14	0.12
Rated Voltage(V <sub>DC</sub> )	10	16	25	35	50								
Tan $\delta$ (Max.)	0.24	0.20	0.16	0.14	0.12								
Temperature Characteristics (Max. impedance ratio)	<table border="1"> <tr> <td>Rate Voltage(V<sub>DC</sub>)</td> <td>10 ~ 50</td> </tr> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>4</td> </tr> </table> (at 120Hz)	Rate Voltage(V <sub>DC</sub> )	10 ~ 50	Z(-25°C)/Z(+20°C)	2	Z(-40°C)/Z(+20°C)	4						
Rate Voltage(V <sub>DC</sub> )	10 ~ 50												
Z(-25°C)/Z(+20°C)	2												
Z(-40°C)/Z(+20°C)	4												
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied at 150°C for 1,000 hours. Capacitance change $\leq$ ±30% of the initial value TAN $\delta$ $\leq$ 300% of the initial specified value Leakage Current $\leq$ The initial specified value												
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 150°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change $\leq$ ±30% of the initial value TAN $\delta$ $\leq$ 300% of the initial specified value Leakage Current $\leq$ The initial specified value												
others	Satisfied characteristics KS C IEC 60384-4												

### DIMENSIONS OF PHA Series

Unit(mm)

Marking : YELLOW SLEEVE, BLACK INK

øD	10	12.5	16
ød	0.6	0.6	0.8
F	5.0	5.0	7.5
øD'	øD + 0.5 max.		
L'	L + 2.0 max.		



# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

## RATINGS OF PHA Series

V <sub>DC</sub>		10		16		25		
Items μF	∅ D×L(mm)	Rated Ripple Current (mArms/150°C,120Hz)		∅ D×L(mm)	Rated Ripple Current (mArms/150°C,120Hz)			
		220						10×16
330				10×16	370		12.5×20	600
470	10×16	370		12.5×20	600		16×31.5	1,100
1,000	12.5×20	600		16×31.5	1,100		16×35.5	1,150
2,200	16×31.5	1,100		16×35.5	1,150			
3,300	16×35.5	1,150						

V <sub>DC</sub>		35		50		
Items μF	∅ D×L(mm)	Rated Ripple Current (mArms/150°C,120Hz)		∅ D×L(mm)	Rated Ripple Current (mArms/150°C,120Hz)	
		100	10×16		370	
220	10×20	460		12.5×20	400	
330	12.5×20	600		12.5×25	500	
470	12.5×25	750		16×35.5	700	
1,000	16×35.5	1,150				

## RATED RIPPLE CURRENT MULTIPLIERS

Freq.(Hz)	120	1k	10k	100k
Cap.(μF)				
100 ~ 1,000	1.00	1.15	1.30	1.40
2,200 ~ 3,300	1.00	1.03	1.05	1.08