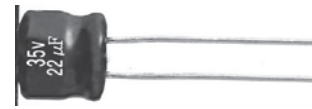
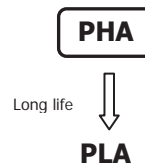


PHA series

- Standard
- Low Profile
- RoHS compliant
- Solvent Proof

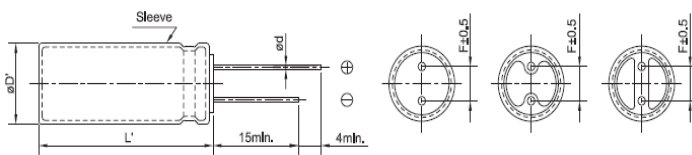
- 105°C 1,000Hrs assured.
- Height 7mm
- Wide Temperature range
- For CAR-Audio, Tuner
- RoHS compliant
- Halogen-free capacitors are also available.



Specifications

Item	Characteristics																					
Rated Voltage Range	6.3 ~ 50VDC																					
Operating Temperature Range	-55 ~ +105°C																					
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)																					
Leakage Current	I=0.01CV(µA) or 3µA, whichever is greater. Where, I:Max. Leakage current(µA), C:Nominal capacitance(µF), V:Rated voltage(VDC) (at 20°C, 2 minutes)																					
Dissipation Factor(Tanδ)	<table border="1"> <tr> <td>Rated Voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tanδ(Max.)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </table> (at 20°C, 120Hz)	Rated Voltage(VDC)	6.3	10	16	25	35	50	Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10							
Rated Voltage(VDC)	6.3	10	16	25	35	50																
Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10																
Temperature characteristics (Max, impedance ratio)	<table border="1"> <tr> <td>Rated Voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Z(-25°C)/(+20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/(+20°C)</td> <td>8</td> <td>6</td> <td>6</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> (at ,120Hz)	Rated Voltage(VDC)	6.3	10	16	25	35	50	Z(-25°C)/(+20°C)	4	3	2	2	2	2	Z(-40°C)/(+20°C)	8	6	6	3	3	3
Rated Voltage(VDC)	6.3	10	16	25	35	50																
Z(-25°C)/(+20°C)	4	3	2	2	2	2																
Z(-40°C)/(+20°C)	8	6	6	3	3	3																
Load life	The following specifications shall be satisfied when then the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C. Capacitance change ≤±20% of the initial value Tan δ ≤200% of the initial specified value Leakage current ≤The of the initial specified value																					
Shelf life	The following specifications shall be satisfied when the capacitors are restored are restored to 20°C after exposing them for 1,000 hours at 105°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 ≤±20% of the initial value(where, ±25% for 6.3VDC ~ 16VDC) Tanδ ≤200% of the initial specified value Leakage current ≤200%The initial specified value																					

Dimensions

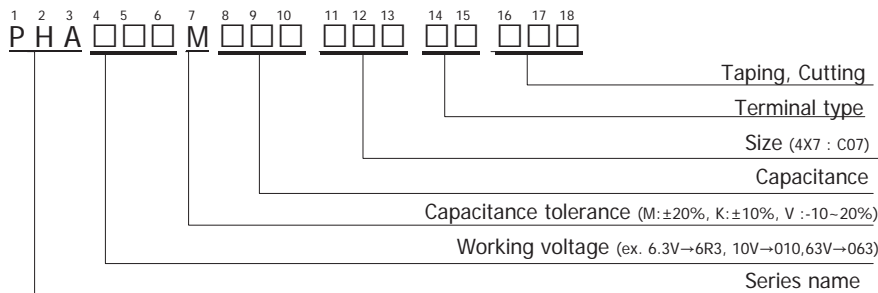


Unit(mm)

	4	5	6.3	8
ØD	4	5	6.3	8
Ød	0.45			
F	1.5	2.0	2.5	3.5
ØD'	ØD+0.5 max.			
L'	L+1.0 max			

- Printed white color letter on PET ultramarine blue sleeve

Code numbering system



Ø4	C
Ø5	D
Ø6.3	E
Ø8	F

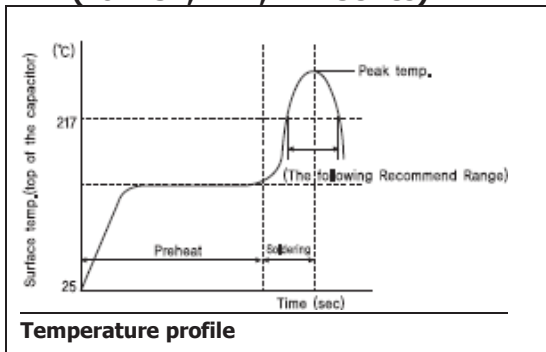
PHA series

Standard Rating

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA rms/85°C, 120Hz)	Code No
6.3	22	4 x 7	0.22	31	PHA6R3□220C07CS□□□
	33	5 x 7	0.22	39	PHA6R3□330D07CS□□□
	47	5 x 7	0.22	47	PHA6R3□470D07CS□□□
	68	6.3 x 7	0.22	57	PHA6R3□680E07CS□□□
	100	6.3 x 7	0.22	71	PHA6R3□101E07CS□□□
	150	8 x 7	0.22	94	PHA6R3□151F07CS□□□
10	15	4 x 7	0.19	28	PHA010□220C07CS□□□
	22	5 x 7	0.19	35	PHA010□330D07CS□□□
	33	5 x 7	0.19	43	PHA010□470D07CS□□□
	47	6.3 x 7	0.19	53	PHA010□680E07CS□□□
	68	6.3 x 7	0.19	63	PHA010□101E07CS□□□
	100	6.3 x 7	0.19	80	PHA010□151E07CS□□□
16	6.8	4 x 7	0.16	20	PHA016□680C07CS□□□
	10	4 x 7	0.16	25	PHA016□100C07CS□□□
	15	5 x 7	0.16	31	PHA016□150D07CS□□□
	22	5 x 7	0.16	39	PHA016□220D07CS□□□
	33	6.3 x 7	0.16	49	PHA016□330E07CS□□□
	47	6.3 x 7	0.16	59	PHA016□470E07CS□□□
25	4.7	4 x 7	0.14	19	PHA025□470C07CS□□□
	6.8	5 x 7	0.14	23	PHA025□680D07CS□□□
	10	5 x 7	0.14	28	PHA025□100D07CS□□□
	15	6.3 x 7	0.14	35	PHA025□150E07CS□□□
	22	6.3 x 7	0.14	43	PHA025□220E07CS□□□
	33	6.3 x 7	0.14	53	PHA025□330E07CS□□□
35	4.7	8 x 7	0.14	68	PHA025□470F07CS□□□
	3.3	4 x 7	0.12	17	PHA035□330C07CS□□□
	4.7	4 x 7	0.12	20	PHA035□470C07CS□□□
	6.8	5 x 7	0.12	24	PHA035□680D07CS□□□
	10	5 x 7	0.12	30	PHA035□100D07CS□□□
	15	6.3 x 7	0.12	37	PHA035□150E07CS□□□
22	6.3 x 7	0.12	47	PHA035□220E07CS□□□	
33	8 x 7	0.12	62	PHA035□330F07CS□□□	

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA rms/85°C, 120Hz)	Code No
50	0.1	4 x 7	0.10	1.3	PHA050□R10C07CS□□□
	0.15	4 x 7	0.10	2.0	PHA050□R15C07CS□□□
	0.22	4 x 7	0.10	2.9	PHA050□R22C07CS□□□
	0.33	4 x 7	0.10	3.5	PHA050□R33C07CS□□□
	0.47	4 x 7	0.10	5.0	PHA050□R47C07CS□□□
	0.68	4 x 7	0.10	7.1	PHA050□R68C07CS□□□
	1.0	4 x 7	0.10	10	PHA050□R10C07CS□□□
	1.5	4 x 7	0.10	12	PHA050□R15C07CS□□□
	2.2	4 x 7	0.10	15	PHA050□R22C07CS□□□
	3.3	4 x 7	0.10	18	PHA050□R33C07CS□□□
	4.7	5 x 7	0.10	22	PHA050□R47D07CS□□□
	6.8	6.3 x 7	0.10	25	PHA050□R68E07CS□□□
	10	6.3 x 7	0.10	31	PHA050□R100E07CS□□□
	15	6.3 x 7	0.10	48	PHA050□R150E07CS□□□
	22	6.3 x 7	0.10	58	PHA050□R220E07CS□□□
	33	8 x 7	0.10	68	PHA050□R330F07CS□□□

Recommended reflow soldering conditions (For PSA, PHA, PLA Series)



Time of preheat temp. (from 150 °C to 200 °C)	Time to be maintained above 217 °C	Time to be maintained above 230 °C	Peak temp.	Reflow cycle
60-100 Sec	60-70 sec	20-30 Sec	250 (10 Sec.)	1 TIME