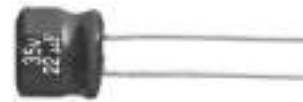
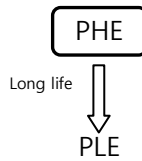


PHE series

- Standard
- Low Profile
- RoHS compliant
- Solvent Proof

- 105°C 1,000Hrs assured.
- Height 5mm
- Wide Temperature range
- For CAR-Audio, Tuner
- Halogen-free capacitors are also available.



Specifications

Item	Characteristics																		
Rated Voltage Range	4 ~ 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>4</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>0.30</td> <td>0.27</td> <td>0.23</td> <td>0.19</td> <td>0.15</td> <td>0.13</td> <td>0.11</td> </tr> </table> (at 20°C, 120Hz)	Rated Voltage(VDC)	4	6.3	10	16	25	35	50	Tanδ(Max.)	0.30	0.27	0.23	0.19	0.15	0.13	0.11		
Rated Voltage(VDC)	4	6.3	10	16	25	35	50												
Tanδ(Max.)	0.30	0.27	0.23	0.19	0.15	0.13	0.11												
Temperature characteristics (Max. impedance ratio)	<table border="1"> <tr> <td>Rated Voltage(VDC)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25-50</td> </tr> <tr> <td>Z(-25°C)/(20°C)</td> <td>6</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/(20°C)</td> <td>12</td> <td>9</td> <td>7</td> <td>5</td> <td>3</td> </tr> </table> (at 120Hz)	Rated Voltage(VDC)	4	6.3	10	16	25-50	Z(-25°C)/(20°C)	6	3	3	2	2	Z(-40°C)/(20°C)	12	9	7	5	3
Rated Voltage(VDC)	4	6.3	10	16	25-50														
Z(-25°C)/(20°C)	6	3	3	2	2														
Z(-40°C)/(20°C)	12	9	7	5	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 Tanδ ≤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 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 Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value																		

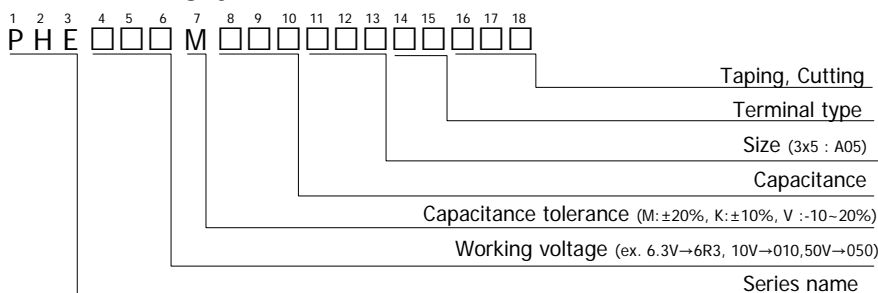
Dimension (CE04 Type)

Unit (mm)

	3	3.5	4	5	6.3
ØD	3	3.5	4	5	6.3
Ød	0.4	0.4	0.45	0.5	0.5
F	1.0	1.0	1.5	2.0	2.5
ØD'	ØD+0.5 max.				
L'	L+1.0 max				

- Printed white color letter on PET ultramarine blue sleeve

Code numbering system



Ø3	A
Ø3.5	B
Ø4	C
Ø5	D
Ø6.3	E

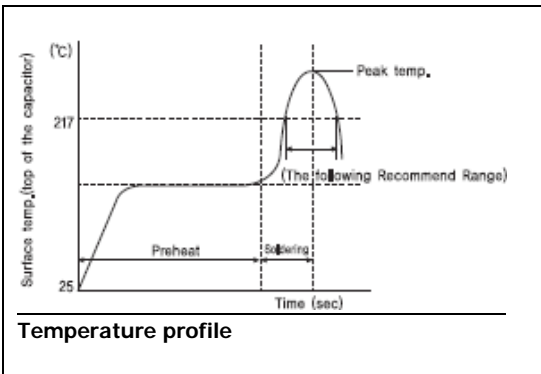
PHE series

Standard Rating

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{rms} /105°C, 120Hz)	Code No
4	15	3.5 x 5	0.30	15	PHE004□150B05CS□□□
	22	4 x 5	0.30	21	PHE004□220C05CS□□□
	33	4 x 5	0.30	29	PHE004□330C05CS□□□
	47	4 x 5	0.30	36	PHE004□470C05CS□□□
	68	5 x 5	0.30	45	PHE004□680D05CS□□□
100	5 x 5	0.30	55	PHE004□101D05CS□□□	
6.3	10	3 x 5	0.27	12	PHE6R3□100A05CS□□□
	15	3.5 x 5	0.27	16	PHE6R3□150B05CS□□□
	22	4 x 5	0.27	21	PHE6R3□220C05CS□□□
	33	5 x 5	0.27	30	PHE6R3□330D05CS□□□
	47	5 x 5	0.27	36	PHE6R3□470D05CS□□□
	68	6.3 x 5	0.27	46	PHE6R3□680E05CS□□□
100	6.3 x 5	0.27	56	PHE6R3□101E05CS□□□	
10	6.8	3 x 5	0.23	11	PHE010□680A05CS□□□
	10	3.5 x 5	0.23	14	PHE010□100B05CS□□□
	15	4 x 5	0.23	20	PHE010□150C05CS□□□
	22	5 x 5	0.23	27	PHE010□220D05CS□□□
	33	5 x 5	0.23	34	PHE010□330D05CS□□□
	47	6.3 x 5	0.23	43	PHE010□470E05CS□□□
68	6.3 x 5	0.23	52	PHE010□680E05CS□□□	
16	4.7	3 x 5	0.19	9.4	PHE016□47A05CS□□□
	6.8	3.5 x 5	0.19	13	PHE016□68B05CS□□□
	10	3.5 x 5	0.19	16	PHE016□100B05CS□□□
	15	5 x 5	0.19	25	PHE016□150D05CS□□□
	22	5 x 5	0.19	30	PHE016□220D05CS□□□
	33	6.3 x 5	0.19	40	PHE016□330E05CS□□□
	47	6.3 x 5	0.19	48	PHE016□470E05CS□□□

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{rms} /105°C, 120Hz)	Code No
25	3.3	3 x 5	0.16	8.8	PHE025□3R3A05CS□□□
	4.7	3.5 x 5	0.16	11	PHE025□4R7B05CS□□□
	6.8	4 x 5	0.16	16	PHE025□6R8C05CS□□□
	10	5 x 5	0.16	23	PHE025□100D05CS□□□
	15	6.3 x 5	0.16	30	PHE025□150E05CS□□□
	22	6.3 x 5	0.16	37	PHE025□220E05CS□□□
33	6.3 x 5	0.16	45	PHE025□330E05CS□□□	
35	2.2	3 x 5	0.12	7.7	PHE035□2R2A05CS□□□
	3.3	3.5 x 5	0.12	11	PHE035□3R3B05CS□□□
	4.7	4 x 5	0.12	15	PHE035□4R7C05CS□□□
	6.8	5 x 5	0.12	20	PHE035□6R8D05CS□□□
	10	5 x 5	0.12	25	PHE035□100D05CS□□□
	15	6.3 x 5	0.12	33	PHE035□150E05CS□□□
22	6.3 x 5	0.12	40	PHE035□220E05CS□□□	
50	0.1	3 x 5	0.10	1.3	PHE050□R10A05CS□□□
	0.15	3 x 5	0.10	2	PHE050□R15A05CS□□□
	0.22	3 x 5	0.10	2.6	PHE050□R22A05CS□□□
	0.33	3 x 5	0.10	3.2	PHE050□R33A05CS□□□
	0.47	3 x 5	0.10	3.8	PHE050□R47A05CS□□□
	0.68	3 x 5	0.10	4.6	PHE050□R68A05CS□□□
	1.0	3 x 5	0.10	5.6	PHE050□1R0A05CS□□□
	1.5	3 x 5	0.10	6.9	PHE050□1R5A05CS□□□
	2.2	3.5 x 5	0.10	10	PHE050□2R2B05CS□□□
	3.3	4 x 5	0.10	14	PHE050□3R3C05CS□□□
4.7	5 x 5	0.10	19	PHE050□4R7D05CS□□□	
6.8	6.3 x 5	0.10	24	PHE050□6R8E05CS□□□	
10	6.3 x 5	0.10	29	PHE050□100E05CS□□□	

Recommended reflow soldering conditions (For PSE, PHE, PLE 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