

# FH Series 105°C high ripple current at frequency range

## Feature

- ◆ New innovative electrolyte is employed to minimize ESR
- ◆ Long life 4000 to 10000 hours at 105°C
- ◆ Non solvent proof type
- ◆ 6.3 to 100VDC newly type
- ◆ RoHS compliance.

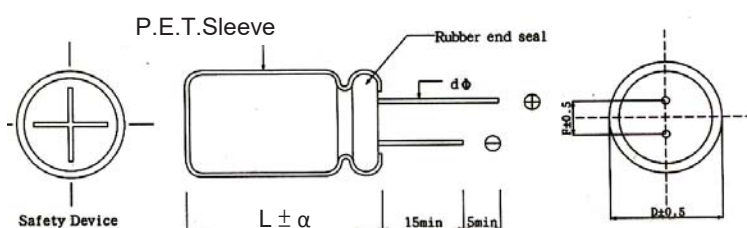
## Specificatio

Item	Performance Characteristics																											
Operating Temperature	-40 to +105°C																											
Rated Voltage Range	6.3~100V.DC																											
capacitance range	6.8~18000uF																											
Capacitance Tolerance	±20% (120Hz, +20°C)																											
Leakage Current (+20°C,max.)	$I \leq 0.01CV$ or $3\mu A$ whichever is greater, with rated working voltage applied(After 2 minutes). $I =$ Leakage Current( $\mu A$ ) $C =$ Rated Capacitance $V =$ Rated voltage(V)																											
Dissipation Factor (tan $\delta$ , at 20°C, 120Hz)	<table border="1"> <tr> <td>working voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>D.F.(%)max</td> <td>22</td> <td>19</td> <td>16</td> <td>14</td> <td>12</td> <td>10</td> <td>9</td> <td>8</td> </tr> </table> <p>For capacitance &gt; 1000<math>\mu F</math>, add 2% per another 1000<math>\mu F</math></p>	working voltage(VDC)	6.3	10	16	25	35	50	63	100	D.F.(%)max	22	19	16	14	12	10	9	8									
working voltage(VDC)	6.3	10	16	25	35	50	63	100																				
D.F.(%)max	22	19	16	14	12	10	9	8																				
Low Temperature Characteristics (at 120Hz)	<p>Impedance ratio max</p> <table border="1"> <tr> <td>Working Voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C / Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Working Voltage(VDC)	6.3	10	16	25	35	50	63	100	Z-25°C / Z+20°C	4	3	2	2	2	2	2	2	Z-40°C / Z+20°C	8	6	4	3	3	3	3	3
Working Voltage(VDC)	6.3	10	16	25	35	50	63	100																				
Z-25°C / Z+20°C	4	3	2	2	2	2	2	2																				
Z-40°C / Z+20°C	8	6	4	3	3	3	3	3																				
Endurance	<p>Test conditions</p> <p>Duration time:</p> <table border="1"> <tr> <td colspan="2">size</td> <td><math>\phi D \leq 6.3</math></td> <td><math>\Phi D = 8, 10</math></td> <td><math>\phi D \geq 13</math></td> </tr> <tr> <td rowspan="2">voltage</td> <td>6.3~10WV</td> <td>4000hrs</td> <td>6000hrs</td> <td>8000hrs</td> </tr> <tr> <td>16~100WV</td> <td>5000hrs</td> <td>7000hrs</td> <td>10000hrs</td> </tr> </table> <p>Ambient temperature : +105°C            Applied voltage : Rated DC working voltage            After test requirement at +20°C            Capacitance change : within ±25% of the initial measured value            Dissipation factor : <math>\leq</math> 200% of the initial specified value            Leakage current : <math>\leq</math> The initial specified value</p>	size		$\phi D \leq 6.3$	$\Phi D = 8, 10$	$\phi D \geq 13$	voltage	6.3~10WV	4000hrs	6000hrs	8000hrs	16~100WV	5000hrs	7000hrs	10000hrs													
size		$\phi D \leq 6.3$	$\Phi D = 8, 10$	$\phi D \geq 13$																								
voltage	6.3~10WV	4000hrs	6000hrs	8000hrs																								
	16~100WV	5000hrs	7000hrs	10000hrs																								
Shelf Life	<p>Test conditions</p> <p>Duration time : 1000Hrs            Ambient temperature : +105°C            Applied voltage : None            After test requirement at +20°C : Same limits as Endurance.            Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.</p>																											

## Multiplier for Ripple Current vs.

CAP( $\mu$ )	50(60)	120	400	1K	10K	100K
CAP $\leq$ 10	0.47	0.59	0.76	0.85	0.97	1.00
10 < CAP $\leq$ 100	0.52	0.62	0.80	0.89	0.97	1.00
100 < CAP $\leq$ 1000	0.58	0.72	0.84	0.90	0.98	1.00
1000 < CAP	0.63	0.78	0.87	0.91	0.98	1.00

## Diagram of Dimensions:(unit:mm)



D $\phi$	5	6.3	8	10	13	16	18
F	2	2.5	3.5	5.0	7.5		
d $\phi$	0.5	L < 20		L $\geq$ 20		0.6	0.8
		0.5	0.6				

$\alpha$	D < 18	D = 18		D > 18
		L < 35.5	L $\geq$ 35.5	
1.5	1.5	2.0	2.0	

## Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/105°C /100KHz)	Max ESR( Ω) at 20°C /100kHz
6.3	150	5×11	220	0.550
6.3	220	6.3×11	300	0.260
6.3	330	6.3×11	350	0.210
6.3	470	8×11.5	440	0.140
6.3	680	8×11.5	650	0.130
6.3	820	10×12.5	870	0.090
6.3	1000	8×16	850	0.080
6.3	1200	8×20	1060	0.075
6.3	1200	10×16	1220	0.064
6.3	1500	10×20	1410	0.050
6.3	1800	13×16	1460	0.049
6.3	2200	10×25	1660	0.046
6.3	2700	16×16	1950	0.042
6.3	3300	13×20	1910	0.038
6.3	3900	13×25	2240	0.029
6.3	3900	18×16	2220	0.040
6.3	4700	13×30	2660	0.027
6.3	5600	13×35	2890	0.024
6.3	5600	16×21	2540	0.027
6.3	6800	13×40	3360	0.017
6.3	6800	16×25	2940	0.021
6.3	6800	18×21	2870	0.026
6.3	8200	16×31.5	3460	0.017
6.3	10000	16×35.5	3620	0.015
6.3	10000	18×25	3150	0.019
6.3	12000	16×41	4090	0.013
6.3	12000	18×31.5	4180	0.015
6.3	15000	18×35.5	4230	0.014
6.3	18000	18×41	4290	0.012
10	100	5×11	220	0.580
10	220	6.3×11	350	0.230
10	330	6.3×11	450	0.220
10	470	8×11.5	650	0.130
10	680	8×16	850	0.096
10	680	10×12.5	870	0.085
10	820	10×16	950	0.075
10	1000	8×20	1060	0.072
10	1000	10×16	1220	0.064
10	1200	10×20	1410	0.045
10	1500	10×25	1560	0.043
10	1500	13×16	1460	0.049
10	2200	10×30	1920	0.030
10	2200	13×20	1910	0.035
10	2200	16×16	1950	0.042
10	2700	18×16	2220	0.043
10	3300	13×25	2240	0.029
10	3900	13×30	2660	0.025
10	3900	16×21	2540	0.027
10	4700	13×35	2890	0.020
10	5600	13×40	3360	0.017
10	5600	16×25	2940	0.021
10	5600	18×21	2870	0.026
10	6800	16×31.5	3460	0.017
10	6800	18×25	3150	0.019
10	8200	16×35.5	3620	0.015
10	8200	18×31.5	4180	0.015
10	10000	16×41	4090	0.013
10	10000	18×35.5	4230	0.014
10	12000	18×41	4290	0.012
16	56	5×11	220	0.560

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/105°C /100KHz)	Max ESR( Ω) at 20°C /100kHz
16	100	6.3×11	300	0.220
16	120	6.3×11	350	0.215
16	220	8×11.5	500	0.180
16	330	8×11.5	650	0.140
16	470	8×11.5	740	0.100
16	470	8×16	850	0.095
16	470	10×12.5	870	0.085
16	680	8×20	1060	0.080
16	680	10×16	1220	0.060
16	820	10×20	1300	0.052
16	1000	10×20	1410	0.046
16	1000	13×16	1460	0.050
16	1200	10×25	1660	0.044
16	1500	10×25	1770	0.036
16	1500	10×30	1920	0.031
16	1500	13×20	1910	0.037
16	1500	16×16	1950	0.042
16	1800	10×25	1800	0.036
16	1800	13×25	2080	0.030
16	2200	13×25	2240	0.026
16	2200	18×16	2220	0.043
16	2700	13×30	2660	0.023
16	2700	16×21	2540	0.027
16	3300	13×35	2890	0.022
16	3900	13×40	3360	0.017
16	3900	16×25	2940	0.021
16	3900	18×21	2870	0.026
16	4700	16×31.5	3460	0.017
16	4700	18×25	3150	0.020
16	5600	16×35.5	3620	0.015
16	5600	18×31.5	4180	0.015
16	6800	16×41	4090	0.013
16	8200	18×35.5	4230	0.014
16	10000	18×41	4290	0.012
25	47	5×11	220	0.560
25	56	5×11	260	0.560
25	100	6.3×11	350	0.250
25	220	8×11.5	650	0.150
25	330	8×16	850	0.092
25	330	10×12.5	870	0.082
25	470	8×20	1060	0.074
25	470	10×12.5	1100	0.074
25	470	10×16	1220	0.068
25	680	10×20	1410	0.050
25	680	13×16	1460	0.049
25	820	10×25	1660	0.041
25	1000	10×30	1920	0.032
25	1000	13×20	1910	0.036
25	1000	16×16	1950	0.042
25	1200	18×16	2220	0.043
25	1500	13×25	2240	0.028
25	1800	13×30	2660	0.024
25	1800	16×21	2540	0.027
25	2200	13×30	2695	0.025
25	2200	13×35	2890	0.023
25	2200	18×21	2870	0.026
25	2700	13×40	3360	0.017
25	2700	16×25	2940	0.022
25	3300	16×31.5	3460	0.017
25	3300	18×25	3150	0.019

## Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/105°C /100KHz)	Max ESR( Ω) at 20°C /100kHz	WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/105°C /100KHz)	Max ESR( Ω) at 20°C /100kHz
25	3900	16×35.5	3620	0.015	50	1000	18×21	2500	0.036
25	3900	18×31.5	4180	0.015	50	1200	16×31.5	3020	0.030
25	4700	16×41	4090	0.013	50	1200	18×25	2750	0.026
25	4700	18×35.5	4230	0.014	50	1500	16×35.5	3160	0.019
25	5600	18×41	4290	0.012	50	1800	16×41	3720	0.016
35	33	5×11	230	0.550	50	1800	18×31.5	3645	0.021
35	47	5×11	300	0.450	50	2200	18×35.5	3690	0.017
35	56	6.3×11	360	0.210	50	2700	18×41	3810	0.014
35	100	6.3×11	480	0.180	50	3300	18×41	3810	0.014
35	150	8×11.5	680	0.140	63	15	5×11	65	1.800
35	220	8×11.5	870	0.095	63	33	6.3×11	260	1.200
35	220	8×16	1000	0.090	63	47	8×11.5	360	0.660
35	220	10×12.5	1060	0.080	63	56	8×11.5	380	0.600
35	270	8×20	1180	0.070	63	82	8×16	460	0.440
35	330	10×16	1380	0.062	63	82	10×12.5	500	0.430
35	470	10×20	1800	0.048	63	100	10×12.5	640	0.340
35	470	13×16	1560	0.049	63	120	8×20	700	0.320
35	560	10×25	1900	0.042	63	120	10×16	760	0.300
35	680	10×30	2000	0.035	63	180	10×20	880	0.190
35	680	13×20	2100	0.034	63	180	13×16	800	0.180
35	680	16×16	2050	0.042	63	220	10×20	995	0.188
35	1000	13×20	2180	0.038	63	220	10×25	1100	0.185
35	1000	13×25	2400	0.028	63	270	10×30	1200	0.120
35	1000	18×16	2220	0.043	63	270	13×20	1200	0.160
35	1200	13×30	2800	0.024	63	270	16×16	1200	0.110
35	1200	16×21	2800	0.028	63	330	13×25	1600	0.120
35	1500	13×35	3000	0.022	63	390	18×16	1610	0.096
35	1800	13×40	3360	0.017	63	470	13×30	1800	0.100
35	1800	16×25	2940	0.020	63	470	16×21	1500	0.077
35	1800	18×21	2870	0.026	63	560	13×35	2000	0.070
35	2200	16×31.5	3460	0.017	63	560	16×25	2000	0.073
35	2200	18×21	2930	0.025	63	680	13×40	2200	0.070
35	2200	18×25	3150	0.019	63	680	18×21	1600	0.072
35	2700	16×35.5	3620	0.018	63	820	16×31.5	2400	0.054
35	2700	18×31.5	4180	0.016	63	820	18×25	1800	0.052
35	3300	16×41	4090	0.013	63	1000	16×35.5	2500	0.048
35	3300	18×35.5	4230	0.014	63	1000	18×25	2290	0.052
35	3900	18×41	4300	0.012	63	1000	18×31.5	2800	0.047
50	22	5×11	220	0.650	63	1200	16×41	2920	0.040
50	47	6.3×11	270	0.370	63	1200	18×31.5	2850	0.045
50	56	6.3×11	300	0.290	63	1200	18×35.5	3000	0.039
50	100	8×11.5	680	0.160	63	1500	18×41	3200	0.036
50	120	8×16	760	0.120	100	6.8	5×11	65	1.800
50	150	10×12.5	800	0.120	100	15	6.3×11	130	1.000
50	180	8×20	1000	0.090	100	27	8×11.5	300	0.610
50	220	10×16	1300	0.082	100	39	8×16	340	0.360
50	270	10×20	1350	0.060	100	47	10×12.5	400	0.420
50	270	13×16	1270	0.061	100	56	8×20	410	0.260
50	330	10×25	1600	0.057	100	68	10×16	460	0.300
50	470	10×30	1800	0.048	100	82	10×20	600	0.210
50	470	13×20	1740	0.045	100	82	13×16	540	0.180
50	470	16×16	1710	0.055	100	100	10×25	800	0.200
50	560	13×25	1960	0.042	100	120	10×30	830	0.120
50	560	18×16	1940	0.054	100	120	13×20	900	0.160
50	680	13×30	2320	0.030	100	150	13×20	1000	0.110
50	820	13×35	2520	0.025	100	150	16×16	1000	0.110
50	820	16×21	2220	0.034	100	180	13×25	1010	0.096
50	1000	13×35	2650	0.024	100	180	18×16	1180	0.096
50	1000	13×40	2930	0.021	100	220	13×30	1210	0.080
50	1000	16×25	2565	0.025	100	220	16×21	1140	0.077

## Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/105°C /100KHz)	Max ESR(Ω) at 20°C /100kHz
100	270	13×35	1450	0.070
100	270	16×25	1480	0.073
100	330	13×40	1600	0.071
100	330	18×21	1400	0.072
100	390	16×31.5	1700	0.055
100	390	18×25	1740	0.054
100	470	16×35.5	1910	0.047
100	470	18×31.5	1730	0.047
100	560	16×41	2140	0.036
100	680	18×35.5	2000	0.042
100	820	18×41	2480	0.040
100	1000	18×41	2580	0.038

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