



# DC FAN CUSTOMIZED LIFE EXPERIMENT TEST REPORT

Available for these models with lower speed and same physical structure. All model may be followed by ARxx or AFxx series suffixes. This test report applies to <b>PFC120x120x38.0 mm</b> series as the right table	<b>PFB1212GHE</b>	<b>PFB1212HHE</b>		
	<b>PFB1212EHE</b>	<b>PFB1212UHE</b>		
	<b>PFB1212SHE</b>	<b>PFC1212DE-5G27</b>		
	<b>PFB1212VHE</b>			

**Representative Test P/N :PFC1212DE-F00**

**Equipment: 1.Oven: E24-F0036**

☉ **L<sub>10</sub> Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C**  
 According to the equation for **Weibull distribution**, **MTTF ≐ 7×L10 = 490,000 hours**  
 And we rely on a zero failure Weibull test strategy and accelerated testing technique, to determine the total test time (t) for verifying the above life estimation by the equations,

$$t = 1.036 \times \text{MTTF} \times [(B_{r,c}) \div n]^{0.91} \div A_F, \text{ and } A_F = 2^{(T_s - T_u)/10}$$

where, (B<sub>r,c</sub>) is Poisson distribution factor with the failure number of r equal to 0 and the decimal confidence level of c equal to 0.90(90%).

Stress/Elevated Temperature T <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°C)	Acceleration Factor A <sub>F</sub>	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B <sub>r,c</sub>	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
<b>60</b>	<b>40</b>	<b>4.00</b>	<b>56</b>	<b>2.303</b>	<b>6,956</b>	<b>12,360.0</b>	<b>870,728</b>	<b>124,390</b>

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
<b>2005/5/24 4:30 PM</b>	2007/11/5 4:33 AM	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	<b>12360.0</b>

Herewith, we could assume as right on the basis of above test result. Besides, if the actual test time exceed the required, it comes out that those fans' L<sub>10</sub> expectancy and MTTF are greater than the warrant. (MTTF: means Mean Time To Failures, it should be used in a non-repairable system setting. Now we show the MTTF in our life report, that's because we will not repair the failed fans during life experiment. MTBF: means Mean Time Between failures, it should be used in a repairable system setting.)

Temperature for MTTF Estimation (°C)	Acceleration Factor A <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	11.31	2,462,790	351,827
30	8.00	1,741,455	248,779
40	4.00	870,728	124,390
50	2.00	435,364	62,195
<b>60</b>	<b>1.00</b>	<b>217,682</b>	<b>31,097</b>

Fan permission criteria for the measurement after test :

1. For current, the limit is less than spec.(max.).
2. For speed, the allowable decrease is less than 15%.
3. For noise, the limit is less than spec.(max.). + 3 dB

<b>Test Result</b>	<input checked="" type="checkbox"/> <b>Accept</b>
	<input type="checkbox"/> <b>Reject</b>

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
<b>DG05FNL090</b>	<b>14512.50</b>	<b>2008/6/17 9:00 AM</b>	<b>Nan Yang</b>	<b>Zenny Lei</b>



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Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
6,956	2005/5/24 4:30 PM	2007/11/5 4:33 AM	56	0	<b>12360.0</b>

Representative Test P/N :PFC1212DE-F00	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
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Equipment: 1.Oven: E24-F0036

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test		Deviation (%)	Final Test		Deviation (%)	Initial Test		Final Test		Deviation (%)
	Current Spec. (A)	Current Spec. (A)		(RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)			
	<b>4.80Max.</b>	<b>4.80Max.</b>		<b>4950-6050</b>	<b>4950-6050</b>		<b>70.5Max</b>	<b>70.5Max</b>			
1	3.96	4.11	3.8	5563	5582	0.3	67.3	68.1	1.2		
2	3.96	4.18	5.5	5531	5574	0.8	67.5	67.9	0.6		
3	3.92	3.99	1.7	5495	5542	0.9	67.7	67.2	-0.7		
4	3.99	4.16	4.2	5566	5523	-0.8	67.9	67.5	-0.6		
5	4.02	3.99	-0.7	5596	5528	-1.2	67.5	67.7	0.3		
6	4.04	4.01	-0.6	5585	5480	-1.9	67.8	67.3	-0.7		
7	3.99	4.21	5.6	5449	5509	1.1	67.0	67.5	0.7		
8	3.96	4.13	4.4	5599	5549	-0.9	67.3	67.8	0.7		
9	3.88	4.17	7.6	5685	5539	-2.6	67.9	67.4	-0.7		
10	3.98	4.19	5.3	5466	5538	1.3	67.0	67.7	1.0		
11	4.03	4.21	4.6	5553	5523	-0.5	67.3	67.5	0.3		
12	3.77	4.20	11.4	5641	5536	-1.9	67.5	67.9	0.6		
13	3.95	4.14	4.9	5567	5548	-0.3	67.3	67.5	0.3		
14	4.01	4.22	5.3	5559	5487	-1.3	67.8	67.7	-0.1		
15	3.95	4.18	5.8	5562	5520	-0.8	67.2	67.9	1.0		
16	3.88	4.20	8.4	5487	5506	0.3	67.9	67.4	-0.7		
17	4.01	4.18	4.2	5611	5539	-1.3	67.5	67.5	0.0		
18	3.97	4.18	5.3	5532	5534	0.0	67.9	67.6	-0.4		
19	4.06	4.20	3.4	5576	5519	-1.0	67.7	67.9	0.3		
20	4.06	4.19	3.2	5677	5533	-2.5	67.4	67.7	0.4		
21	4.08	4.14	1.5	5551	5539	-0.2	67.5	67.3	-0.3		
22	4.08	4.14	1.4	5515	5551	0.7	67.9	67.8	-0.1		
23	4.07	4.13	1.5	5546	5549	0.1	67.3	67.5	0.3		
24	3.92	4.20	7.1	5650	5550	-1.8	67.8	67.9	0.1		
25	4.15	4.15	0.1	5601	5548	-0.9	67.9	67.2	-1.0		
26	3.81	4.15	8.9	5659	5546	-2.0	67.8	67.8	0.0		
27	4.03	4.20	4.3	5563	5526	-0.7	67.3	67.3	0.0		
28	4.03	4.15	2.9	5584	5547	-0.7	67.5	67.5	0.0		
29	3.98	4.16	4.5	5568	5545	-0.4	67.5	67.3	-0.3		
30	4.08	4.17	2.2	5587	5537	-0.9	67.9	67.7	-0.3		
31	3.90	4.19	7.4	5626	5539	-1.5	67.7	67.5	-0.3		
32	4.07	4.19	2.9	5562	5546	-0.3	67.3	67.8	0.7		
33	3.93	4.14	5.4	5536	5548	0.2	67.9	67.5	-0.6		
34	3.86	4.17	8.1	5458	5538	1.5	67.1	67.7	0.9		
35	3.88	4.15	7.1	5525	5546	0.4	67.5	67.8	0.4		

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG05FNL090	14512.50	2008/6/17 9:00 AM	Nan Yang	Zenny Lei



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<b>PFB1212GHE</b>	<b>PFB1212HHE</b>
<b>PFB1212EHE</b>	<b>PFB1212UHE</b>
<b>PFB1212SHE</b>	<b>PFC1212DE-5G27</b>
<b>PFB1212VHE</b>	

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
6,956	2005/5/24 4:30 PM	2007/11/5 4:33 AM	56	0	<b>12360.0</b>

Representative Test P/N :PFC1212DE-F00	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
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Equipment: 1.Oven: E24-F0036

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test	Current Spec.	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)
	Current Spec.	Current Spec.		(RPM)	Speed Spec.		Noise Spec.	Noise Spec.	
	( A )	( A )		( RPM )	( RPM )		( dB A )	( dB A )	
	<b>4.80Max.</b>	<b>4.80Max.</b>		<b>4950-6050</b>	<b>4950-6050</b>		<b>70.5Max</b>	<b>70.5Max</b>	
36	3.96	4.16	5.0	5552	5547	-0.1	67.8	67.5	-0.4
37	4.04	4.16	3.1	5599	5538	-1.1	67.5	67.9	0.6
38	4.03	4.14	2.8	5523	5549	0.5	67.2	67.4	0.3
39	4.03	4.14	2.8	5545	5544	0.0	67.9	67.8	-0.1
40	3.91	4.14	5.9	5546	5553	0.1	67.3	67.3	0.0
41	3.90	4.15	6.4	5452	5550	1.8	67.8	67.9	0.1
42	4.04	4.17	3.3	5638	5543	-1.7	67.5	67.4	-0.1
43	3.98	4.18	5.0	5634	5527	-1.9	67.9	67.7	-0.3
44	4.07	4.17	2.6	5477	5545	1.2	67.1	68.1	1.5
45	3.87	4.14	6.9	5502	5526	0.4	67.3	67.2	-0.1
46	4.06	4.19	3.3	5718	5515	-3.6	67.7	67.8	0.1
47	3.94	4.16	5.6	5581	5547	-0.6	67.5	67.5	0.0
48	3.87	4.18	7.9	5308	5547	4.5	67.9	67.7	-0.3
49	3.94	4.17	5.8	5561	5545	-0.3	67.4	67.8	0.6
50	4.05	4.19	3.4	5626	5541	-1.5	67.5	67.9	0.6
51	4.05	4.14	2.2	5631	5542	-1.6	67.9	67.5	-0.6
52	4.01	4.17	4.0	5570	5541	-0.5	67.0	67.8	1.2
53	4.02	4.15	3.2	5626	5542	-1.5	67.5	67.3	-0.3
54	4.03	4.11	2.0	5557	5558	0.0	67.7	67.6	-0.1
55	4.11	4.16	1.2	5580	5550	-0.5	67.3	67.4	0.1
56	3.96	4.18	5.7	5520	5534	0.3	67.9	67.7	-0.3
X-Bar	3.984	4.158	-	5563.9	5538.4	-	67.55	67.62	-
$\sigma$	0.078	0.046	-	68.127	17.042	-	0.281	0.233	-

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