



DC FAN LIFE EXPERIMENT REPORT

Available for these models with lower speed and same physical structure. All model may be followed by Rxx or Fxx series suffixes. This test report applies to AFB120x120x38 mm series as the right table	AFB1224EHE-CF00		
	AFB1224SHE-CF00		
	AFB1248EHE-CF00		
	AFB1248SHE-CF00		

Representative Test P/N :AFB1224EHE-CF00

Equipment: 1.Oven: On/Off Cycles: Every 500 hours

© **L₁₀ 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_{r,c}) 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 _s (°C) (Actual Test Temperature)	Unstress Temperature T _u (°C)	Acceleration Factor A _F	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B _{r,c}	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
70	40	8.00	56	2.303	3,478	3,478.0	490,031	70,004

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2006/5/8 3:00 PM	2007/4/20 10:33 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	3478.0

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' L₁₀ 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. **Basically, MTBF is equal to MTTF, they use same formula to work out a life data.**)

Temperature for MTTF Estimation (°C)	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	22.63	1,386,017	198,002
30	16.00	980,062	140,009
40	8.00	490,031	70,004
50	4.00	245,015	35,002
60	2.00	122,508	17,501
70	1.00	6,340	906

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

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

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL095	1874.00	2006/12/17 3:00 PM	Nan.Yang	Gx.Xu



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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- AFB1224EHE-CF00
- AFB1224SHE-CF00
- AFB1248EHE-CF00
- AFB1248SHE-CF00

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2006/5/8 3:00 PM	2007/4/20 10:33 AM	56	0	3478.0

Representative Test P/N :AFB1224EHE-CF00	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
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Equipment: 1.Oven: On/Off Cycles: Every 500 hours

Test Data Between Initial Test and Final Test

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)
	Current Spec. (A)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	1.56Max.	1.56Max.		4680-5720	4680-5720		66.0Max	66.0Max	
1	1.05	1.06	0.7	5041	5098	1.1	62.1	62.5	0.6
2	1.07	1.19	11.4	5101	5192	1.8	62.5	61.8	-1.1
3	1.07	1.16	8.7	5075	5068	-0.1	62.1	62.3	0.3
4	1.20	1.06	-11.3	5242	4976	-5.1	62.3	61.8	-0.8
5	1.12	1.08	-3.7	5170	5048	-2.4	62.5	62.4	-0.2
6	1.04	1.11	6.5	5039	5223	3.7	62.3	62.0	-0.5
7	1.12	1.05	-6.3	5070	5041	-0.6	62.4	61.8	-1.0
8	1.04	1.08	4.0	5080	4991	-1.8	62.1	62.3	0.3
9	1.05	1.07	2.4	5031	5037	0.1	62.5	62.4	-0.2
10	1.04	1.07	3.3	5041	5054	0.3	62.3	62.1	-0.3
11	1.08	1.01	-6.6	5127	5041	-1.7	62.4	62.9	0.8
12	1.12	1.08	-3.2	5203	5058	-2.8	62.2	62.3	0.2
13	1.16	1.15	-0.5	5225	5152	-1.4	62.5	62.6	0.2
14	1.13	1.15	1.5	4906	5189	5.8	62.1	62.2	0.2
15	1.15	1.09	-5.0	5180	5046	-2.6	62.3	62.5	0.3
16	1.11	1.10	-0.9	5324	5054	-5.1	62.4	62.1	-0.5
17	1.03	1.15	12.0	5051	5151	2.0	62.1	62.6	0.8
18	1.07	1.07	0.2	5057	5028	-0.6	62.6	62.3	-0.5
19	1.06	1.04	-2.1	5104	5000	-2.0	62.3	62.5	0.3
20	1.17	1.13	-3.2	5207	5094	-2.2	62.5	62.1	-0.6
21	1.06	1.01	-4.3	5076	5172	1.9	62.1	62.4	0.5
22	1.12	1.17	4.9	5161	5240	1.5	62.4	62.7	0.5
23	1.18	1.05	-10.9	5256	5049	-3.9	62.1	62.2	0.2
24	1.14	1.13	-0.9	5195	5066	-2.5	62.3	62.5	0.3
25	1.09	1.18	8.6	5134	5178	0.9	62.5	62.1	-0.6
26	1.10	1.13	2.4	5142	5179	0.7	62.1	62.7	1.0
27	1.12	1.10	-2.1	5129	5078	-1.0	62.4	62.3	-0.2
28	1.08	1.10	2.2	5088	5122	0.7	62.0	61.8	-0.3
29	1.06	1.09	3.3	5080	5005	-1.5	62.1	62.1	0.0
30	1.00	1.08	7.8	4966	5048	1.7	62.4	61.9	-0.8
31	1.09	1.01	-7.6	5146	4924	-4.3	62.5	61.9	-1.0
32	1.07	1.13	5.2	5076	5084	0.2	62.1	62.3	0.3
33	1.09	1.08	-1.0	5106	5068	-0.7	62.4	62.7	0.5
34	1.09	1.09	-0.3	5158	5084	-1.4	62.0	62.4	0.6
35	1.11	1.09	-1.5	5164	5144	-0.4	62.5	62.5	0.0

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL095	1874.00	2006/12/17 3:00 PM	Nan.Yang	Gx.Xu



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	Current Spec. (A)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	1.56Max.	1.56Max.		4680-5720	4680-5720		66.0Max	66.0Max	
36	1.10	1.12	2.0	5165	5149	-0.3	62.5	62.1	-0.6
37	1.09	1.12	3.1	5146	5087	-1.1	62.3	62.5	0.3
38	1.04	1.08	4.2	5026	5101	1.5	62.1	61.8	-0.5
39	1.16	1.05	-9.6	5040	4955	-1.7	62.3	62.7	0.6
40	1.11	1.06	-4.5	5168	5037	-2.5	62.5	61.9	-1.0
41	1.13	1.11	-1.9	5192	5102	-1.7	62.0	62.3	0.5
42	1.05	1.13	8.0	4990	5166	3.5	62.4	62.5	0.2
43	1.07	1.13	5.8	5095	5099	0.1	62.1	62.1	0.0
44	1.08	1.06	-1.9	5100	5134	0.7	62.5	62.6	0.2
45	1.09	1.08	-0.5	5147	5076	-1.4	62.2	62.4	0.3
46	1.09	1.08	-1.0	5158	5148	-0.2	62.4	62.7	0.5
47	1.11	1.10	-1.2	5169	5057	-2.2	62.1	62.3	0.3
48	1.06	1.05	-0.6	5082	5054	-0.6	62.3	62.5	0.3
49	1.10	1.11	1.3	5123	5114	-0.2	62.1	62.3	0.3
50	1.04	1.04	0.3	4994	4965	-0.6	62.4	62.9	0.8
51	1.11	1.13	1.7	5130	5051	-1.5	62.1	62.4	0.5
52	1.06	1.07	0.8	5023	5018	-0.1	62.5	62.5	0.0
53	1.10	1.12	1.7	5164	5068	-1.9	62.2	62.5	0.5
54	1.07	1.09	1.7	5058	5056	0.0	62.1	62.8	1.1
55	1.06	1.08	1.9	5072	5000	-1.4	62.4	62.3	-0.2
56	1.10	1.11	0.7	5150	5117	-0.6	62.5	62.5	0.0
X-Bar	1.090	1.094	-	5113.3	5081.0	-	62.29	62.33	-
σ	0.041	0.041	-	76.110	67.607	-	0.173	0.289	-

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