



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 AFB35x35x10 mm series as the right table	AFB03512HA-A	AFB03512MA-A	AFB03512LA-A	
	AFB03505HA-A	AFB03505MA-A	AFB03505LA-A	

Representative Test P/N : [AFB03512HA-A](#)

Equipment: 1.Oven: [E24-F0032](#) On/Off Cycles: Every 500 hours

L₁₀ Expectancy: 30,000 hours minimum @ fan rated voltage and the temperature of 40

According to the equation for **Weibull distribution**, **MTTF 7×L₁₀ = 210,000 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 () (Actual Test Temperature)	Unstress Temperature T _u ()	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 (hours)	Verified L ₁₀ 40 (hours)
70	40	8.00	56	2.303	1,490	1,490.0	209,933	29,990

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2006/3/2 4:00 PM	2006/8/4 4:28 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	1490.0

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.)

Temperature for MTTF Estimation ()	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	22.63	593,779	84,826
30	16.00	419,865	59,981
40	8.00	209,933	29,990
50	4.00	104,966	14,995
60	2.00	52,483	7,498
70	1.00	26,242	3,749

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
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL048	2230.00	2006/8/4 4:00 PM	Nan.Yang	Gx.Xu



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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AFB03512HA-A	AFB03512MA-A	AFB03512LA-A	
AFB03505HA-A	AFB03505MA-A	AFB03505LA-A	

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,490	2006/3/2 4:00 PM	2006/8/4 4:28 PM	56	0	1490.0

Representative Test P/N :AFB03512HA-A	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: E24-F0032 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)	
	0.14Max.	0.14Max.		5950-8050	5950-8050		28.0Max	28.0Max	
1	0.03	0.03	0.0	6736	6649	-1.3	21.3	21.2	-0.5
2	0.03	0.03	0.0	6409	6615	3.2	20.7	20.3	-1.9
3	0.03	0.03	0.0	6563	6846	4.3	21.2	21.3	0.5
4	0.03	0.03	0.0	6489	6647	2.4	21.5	21.4	-0.5
5	0.03	0.03	0.0	6547	6539	-0.1	21.1	20.6	-2.4
6	0.03	0.03	0.0	6552	6779	3.5	21.4	21.2	-0.9
7	0.03	0.03	0.0	6492	6967	7.3	21.2	21.5	1.4
8	0.03	0.03	0.0	6539	6851	4.8	21.6	21.4	-0.9
9	0.03	0.03	0.0	6614	6636	0.3	21.3	21.6	1.4
10	0.03	0.03	0.0	6663	6779	1.7	21.5	21.3	-0.9
11	0.03	0.03	0.0	6642	6833	2.9	21.1	20.7	-1.9
12	0.03	0.03	0.0	6670	6636	-0.5	21.6	20.9	-3.2
13	0.03	0.03	0.0	6478	6702	3.5	21.3	21.0	-1.4
14	0.03	0.03	0.0	6636	6728	1.4	21.5	21.2	-1.4
15	0.03	0.03	0.0	6795	6865	1.0	21.1	21.1	0.0
16	0.03	0.03	0.0	6758	6800	0.6	21.4	21.5	0.5
17	0.03	0.03	0.0	6716	6583	-2.0	21.2	20.9	-1.4
18	0.03	0.03	0.0	6504	6846	5.3	21.5	21.1	-1.9
19	0.03	0.03	0.0	6619	6534	-1.3	20.8	20.2	-2.9
20	0.03	0.03	0.0	6724	6630	-1.4	21.4	21.2	-0.8
21	0.03	0.03	0.0	6398	6744	5.4	21.1	21.3	0.9
22	0.03	0.03	0.0	6413	6671	4.0	21.5	21.4	-0.5
23	0.03	0.03	0.0	6629	6647	0.3	21.2	21.5	1.4
24	0.03	0.03	0.0	6666	6717	0.8	21.6	20.8	-3.7
25	0.03	0.03	0.0	6385	6752	5.7	21.1	21.2	0.5
26	0.03	0.03	0.0	6871	6330	-7.9	21.4	21.3	-0.5
27	0.03	0.03	0.0	6435	6778	5.3	21.5	21.6	0.5
28	0.03	0.03	0.0	6673	6670	0.0	21.3	21.5	0.9
29	0.03	0.03	0.0	6512	6747	3.6	21.6	21.6	0.0
30	0.03	0.03	0.0	6336	6782	7.0	21.3	21.5	0.9
31	0.03	0.03	0.0	6856	6757	-1.4	21.4	21.3	-0.5
32	0.03	0.03	0.0	6632	6625	-0.1	20.8	21.0	1.0
33	0.03	0.03	0.0	6618	6969	5.3	21.3	21.4	0.5
34	0.03	0.03	0.0	6439	6603	2.5	21.4	21.4	0.0
35	0.03	0.03	0.0	6663	6917	3.8	21.0	21.0	0.0

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL048	2230.00	2006/8/4 4:00 PM	Nan.Yang	Gx.Xu



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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)
1,490	2006/3/2 4:00 PM	2006/8/4 4:28 PM	56	0	1490.0

Representative Test P/N :AFB03512HA-A	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: E24-F0032	On/Off Cycles: Every 500 hours
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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)	
	0.14Max.	0.14Max.		5950-8050	5950-8050		28.0Max	28.0Max	
36	0.03	0.03	0.0	6520	6610	1.4	21.4	22.0	2.8
37	0.03	0.03	0.0	6749	6699	-0.7	21.0	21.5	2.4
38	0.03	0.03	0.0	6327	6673	5.5	20.9	22.1	5.7
39	0.03	0.03	0.0	6585	6713	1.9	21.5	21.0	-2.3
40	0.03	0.03	0.0	6641	6567	-1.1	21.2	21.3	0.5
41	0.03	0.03	0.0	6637	6678	0.6	21.4	21.5	0.5
42	0.03	0.03	0.0	6620	6757	2.1	20.8	21.6	3.8
43	0.03	0.03	0.0	6758	6750	-0.1	21.3	21.4	0.5
44	0.03	0.03	0.0	6836	6679	-2.3	21.5	21.3	-0.9
45	0.03	0.03	0.0	6656	6577	-1.2	21.1	21.4	1.4
46	0.03	0.03	0.0	6428	6582	2.4	21.6	21.2	-1.9
47	0.03	0.03	0.0	6766	6991	3.3	21.3	21.0	-1.4
48	0.03	0.03	0.0	6484	6631	2.3	20.8	21.2	1.9
49	0.03	0.03	0.0	6673	6602	-1.1	21.4	21.3	-0.5
50	0.03	0.03	0.0	6813	6573	-3.5	21.1	21.4	1.4
51	0.03	0.03	0.0	6546	6625	1.2	21.5	21.6	0.5
52	0.03	0.03	0.0	6683	6983	4.5	21.2	21.5	1.4
53	0.03	0.03	0.0	6724	6325	-5.9	20.9	21.4	2.4
54	0.03	0.03	0.0	6744	6779	0.5	21.3	21.3	0.0
55	0.03	0.03	0.0	6555	6635	1.2	21.5	21.5	-0.2
56	0.03	0.03	0.0	6800	6630	-2.5	21.2	21.6	1.9
X-Bar	0.030	0.030	-	6606.3	6707.3	-	21.27	21.28	-
	0.000	0.000	-	132.581	127.393	-	0.237	0.338	-

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