



DC FAN LIFE EXPERIMENT 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 AFB50x50x15mm series as the right table	AFB0512HB	AFB0512MB	AFB0512LB		

Representative Test P/N :AFB0512HB-AF00

Equipment: 1.Oven: E24-W520

L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40

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%), and

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	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)
2006/3/24 9:00 AM	2006/8/22 7:16 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 ()	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	61,254	8,751

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

- Accept
 Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2006022	144.50	2006/8/22 7:30 AM	Eileen.lee	Fly.shi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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 AFB50x50x15mm series as the right table	AFB0512HB	AFB0512MB	AFB0512LB		
---	-----------	-----------	-----------	--	--

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2006/3/24 9:00 AM	2006/8/22 7:16 AM	56	0	3478.0

Representative Test P/N :AFB0512HB-AF00	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> process (exceed requested)	<input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-W520				

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 Check. (dB A)	
	0.17max.	0.17max.		6300±8%	6300-15%		38.0max.	38.0+3max.	
1	0.11	0.11	0.0	6283	6381	1.6	34.9	36.7	5.2
2	0.11	0.10	9.1	5956	6218	4.4	34.0	34.3	0.9
3	0.11	0.10	9.1	6034	6381	5.8	32.9	34.5	4.9
4	0.11	0.10	9.1	6010	6344	5.6	34.6	36.0	4.0
5	0.11	0.11	0.0	6146	6333	3.0	34.3	36.2	5.5
6	0.12	0.11	8.3	6084	6301	3.6	34.2	37.1	8.5
7	0.12	0.11	8.3	6021	6289	4.5	33.4	37.6	12.6
8	0.12	0.11	8.3	5927	6451	8.8	33.9	36.7	8.3
9	0.11	0.11	0.0	5944	6321	6.3	34.4	37.2	8.1
10	0.11	0.11	0.0	6062	6329	4.4	33.2	37.2	12.0
11	0.11	0.11	0.0	6137	6285	2.4	33.5	36.9	10.1
12	0.11	0.11	0.0	6007	6313	5.1	33.1	35.0	5.7
13	0.11	0.11	0.0	6052	6258	3.4	32.3	37.9	17.3
14	0.11	0.11	0.0	6074	6269	3.2	32.6	37.2	14.1
15	0.12	0.11	8.3	5928	6361	7.3	32.6	35.9	10.1
16	0.12	0.11	8.3	5940	6341	6.8	32.1	36.8	14.6
17	0.12	0.11	8.3	6044	6414	6.1	33.1	36.5	10.3
18	0.11	0.11	0.0	5920	6329	6.9	34.1	36.7	7.6
19	0.12	0.11	8.3	5969	6214	4.1	33.9	35.7	5.3
20	0.11	0.10	9.1	5927	6301	6.3	33.5	35.7	6.6
21	0.12	0.11	8.3	5918	6464	9.2	32.3	35.6	10.2
22	0.12	0.11	8.3	5960	6435	8.0	33.6	36.1	7.4
23	0.11	0.11	0.0	6091	6398	5.0	33.8	35.4	4.7
24	0.11	0.11	0.0	6002	6285	4.7	33.2	37.4	12.7
25	0.12	0.11	8.3	5987	6369	6.4	32.4	36.2	11.7
26	0.11	0.11	0.0	6097	6378	4.6	34.1	36.6	7.3
27	0.11	0.11	0.0	6047	6305	4.3	33.5	36.5	9.0
28	0.11	0.11	0.0	6013	6362	5.8	34.4	35.7	3.8
29	0.11	0.11	0.0	5953	6348	6.6	34.2	35.9	5.0
30	0.11	0.11	0.0	6015	6293	4.6	33.3	35.7	7.2
31	0.11	0.11	0.0	6118	6385	4.4	34.5	35.2	2.0
32	0.11	0.11	0.0	6033	6294	4.3	33.0	35.7	8.2
33	0.11	0.11	0.0	6072	6344	4.5	34.0	34.4	1.2
34	0.11	0.11	0.0	5919	6250	5.6	33.7	34.7	3.0
35	0.11	0.11	0.0	5999	6365	6.1	32.8	36.1	10.0

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2006022	144.50	2006/8/22 7:30 AM	Eileen.lee	Fly.shi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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 AFB50x50x15mm series as the right table	AFB0512HB	AFB0512MB	AFB0512LB		

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2006/3/24 9:00 AM	2006/8/22 7:16 AM	56	0	3478.0

Representative Test P/N :AFB0512HB-AF00	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-W520				

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A)	Final Test Current Spec. (A)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Check. (dB A)	Deviation (%)
	0.17max.	0.17max.		6300±8%	6300-15%		38.0max.	38.0+3max.	
36	0.11	0.10	9.1	5951	6291	5.7	33.4	34.1	2.1
37	0.11	0.10	9.1	6003	6423	7.0	33.0	35.1	6.4
38	0.12	0.11	8.3	6007	6341	5.6	34.1	35.1	2.9
39	0.12	0.11	10.6	5963	6341	6.3	33.7	36.0	6.8
40	0.11	0.11	0.0	6085	6246	2.6	33.9	35.2	3.8
41	0.11	0.11	0.0	6073	6329	4.2	33.5	36.1	7.8
42	0.11	0.11	0.0	5945	6281	5.7	33.7	36.7	8.9
43	0.12	0.11	8.3	5964	6317	5.9	33.9	37.0	9.1
44	0.11	0.11	0.0	6063	6250	3.1	34.5	36.1	4.6
45	0.12	0.11	10.6	5964	6398	7.3	33.0	37.2	12.7
46	0.12	0.11	8.3	6066	6361	4.9	34.5	35.6	3.2
47	0.12	0.11	8.3	5964	6370	6.8	32.9	35.9	9.1
48	0.12	0.11	8.3	5903	6410	8.6	32.4	35.0	8.0
49	0.12	0.11	8.3	5936	6341	6.8	34.5	36.0	4.3
50	0.12	0.11	8.3	5968	6434	7.8	34.1	36.9	8.2
51	0.12	0.11	8.3	6068	6414	5.7	34.6	36.5	5.5
52	0.12	0.11	8.3	5945	6370	7.1	33.4	35.7	6.9
53	0.12	0.11	8.3	5947	6414	7.9	34.4	36.4	5.8
54	0.11	0.11	0.0	6062	6341	4.6	34.4	35.7	3.8
55	0.11	0.11	0.0	6052	6313	4.3	33.9	35.6	5.0
56	0.11	0.11	0.0	6170	6218	0.8	34.5	36.0	4.3
Mean (X-Stdard)	0.114	0.109	-	6014.071	6336.964	-	33.638	36.052	-
	0.005	0.003	-	75.503	60.621	-	0.707	0.863	-

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2006022	144.50	2006/8/22 7:30 AM	Eileen.lee	Fly.shi