



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 AFB172x150x25.4mm series as the right table	AFB1512EH-AA88			
	AFB1512EHYVB			

Representative Test P/N : AFB1512EH-4L49

Equipment:

☉ **L₁₀ Expectancy: 80,000 hours minimum @ fan rated voltage and the temperature of 40°C**

According to the equation for **Weibull distribution**, **MTTF ≐ 7×L10 = 560,000 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 (°C)	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	3,975	3,975.0	560,055	80,008

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2005/8/27 5:00 PM	2007/4/24 4:36 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	3975.0

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 (°C)	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	22.63	1,584,076	226,297
30	16.00	1,120,111	160,016
40	8.00	560,055	80,008
50	4.00	280,028	40,004
60	2.00	140,014	20,002
70	1.00	70,007	10,001
80	0.50	35,003	5,000

- 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
DG05FNL176	10545.00	2007/4/24 5:00 PM	Nan.Yang	Gx.Xu



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 Rxx or Fxx series suffixes. This test report applies to AFB172x150x25.4mm series as the right table	AFB1512EH-AA88				
	AFB1512EHYVB				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,975	2005/8/27 5:00 PM	2007/4/24 4:36 PM	56	0	3975.0

Representative Test P/N : AFB1512EH-4L49	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:

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.	Current Spec.		Speed Spec.	Speed Spec.		Noise Spec.	Noise Spec.	
	(A)	(A)		(RPM)	(RPM)		(dB A)	(dB A)	
	4.32Max.	4.32Max.		3870-4730	3870-4730		65.5Max	65.5Max	
1	2.78	2.91	4.7	4342	4308	-0.8	63.5	62.3	-1.9
2	2.57	2.78	8.3	4358	4260	-2.2	63.2	62.5	-1.1
3	2.73	2.70	-1.0	4375	4380	0.1	63.4	62.6	-1.3
4	2.65	2.75	3.6	4298	4409	2.6	63.3	63.1	-0.3
5	2.80	2.78	-0.7	4325	4271	-1.2	63.2	63.5	0.5
6	2.87	2.65	-7.5	4242	4323	1.9	63.4	62.8	-0.9
7	2.84	2.59	-8.6	4315	4277	-0.9	63.5	62.9	-0.9
8	2.70	2.85	5.5	4310	4349	0.9	63.2	63.4	0.3
9	2.73	2.86	4.8	4269	4339	1.6	63.4	62.6	-1.3
10	2.72	2.68	-1.3	4275	4248	-0.6	63.1	63.6	0.8
11	2.74	2.76	0.8	4278	4402	2.9	63.2	62.8	-0.6
12	2.73	2.67	-2.2	4369	4311	-1.3	63.5	62.9	-0.9
13	2.72	2.80	2.8	4258	4319	1.4	63.6	63.5	-0.2
14	2.63	2.66	1.2	4275	4328	1.2	63.4	63.5	0.2
15	2.70	2.71	0.3	4377	4300	-1.8	63.2	62.8	-0.6
16	2.76	2.74	-0.8	4346	4238	-2.5	63.5	62.7	-1.3
17	2.73	2.66	-2.3	4345	4277	-1.6	63.6	63.2	-0.6
18	2.61	2.61	-0.1	4362	4437	1.7	63.3	63.5	0.3
19	2.69	2.86	6.3	4360	4342	-0.4	63.4	62.9	-0.8
20	2.64	2.66	0.9	4310	4231	-1.8	63.2	64.0	1.3
21	2.69	2.63	-2.1	4325	4223	-2.4	63.2	62.6	-0.9
22	2.76	2.69	-2.5	4315	4321	0.1	63.5	62.3	-1.9
23	2.65	2.61	-1.8	4328	4247	-1.9	63.4	63.5	0.2
24	2.72	2.60	-4.6	4289	4338	1.1	63.2	63.3	0.2
25	2.89	2.55	-11.7	4278	4347	1.6	63.3	63.1	-0.3
26	2.87	2.74	-4.5	4352	4275	-1.8	63.1	63.0	-0.2
27	2.79	2.63	-5.5	4362	4313	-1.1	63.5	64.2	1.1
28	2.69	2.69	-0.1	4312	4356	1.0	63.2	62.8	-0.6
29	2.57	2.77	8.0	4320	4378	1.3	63.6	62.9	-1.1
30	2.69	2.81	4.2	4310	4314	0.1	63.3	63.5	0.3
31	2.65	2.68	1.3	4302	4351	1.1	63.2	63.6	0.6
32	2.63	2.68	1.8	4314	4249	-1.5	63.1	62.9	-0.3
33	2.42	2.40	-0.7	4215	4180	-0.8	63.5	63.1	-0.6
34	2.76	2.85	3.4	4242	4247	0.1	63.5	63.2	-0.5
35	2.60	2.67	2.7	4247	4347	2.4	63.3	62.5	-1.3

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG05FNL176	10545.00	2007/4/24 5:00 PM	Nan.Yang	Gx.Xu

DC FAN FUNCTION TEST RECORD

FOR LIFE EXPERIMENT



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AFB1512EH-AA88				
AFB1512EHYVB				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,975	2005/8/27 5:00 PM	2007/4/24 4:36 PM	56	0	3975.0
Representative Test P/N : AFB1512EH-4L49			Current Test Status	<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination	
Equipment:					

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) 4.32Max.	Current Spec. (A) 4.32Max.		Speed Spec. (RPM) 3870-4730	Speed Spec. (RPM) 3870-4730		Noise Spec. (dB A) 65.5Max	Noise Spec. (dB A) 65.5Max	
36	2.66	2.71	1.9	4248	4318	1.6	63.4	62.6	-1.3
37	2.71	2.76	1.7	4278	4318	0.9	63.5	62.9	-0.9
38	2.62	2.49	-5.0	4369	4346	-0.5	63.1	63.5	0.6
39	2.69	2.72	0.9	4315	4310	-0.1	63.2	63.4	0.3
40	2.72	2.71	-0.3	4327	4269	-1.3	63.5	62.6	-1.4
41	2.70	2.56	-5.3	4242	4186	-1.3	63.3	62.8	-0.8
42	2.79	2.65	-5.1	4358	4312	-1.1	63.2	64.1	1.4
43	2.69	2.63	-2.2	4346	4340	-0.1	63.5	63.5	0.0
44	2.70	2.53	-6.4	4312	4269	-1.0	63.6	63.6	0.0
45	2.62	2.84	8.2	4315	4312	-0.1	63.5	63.8	0.5
46	2.75	2.79	1.6	4388	4352	-0.8	63.4	64.2	1.3
47	2.66	2.85	7.1	4402	4481	1.8	63.2	63.9	1.1
48	2.72	2.62	-3.7	4315	4320	0.1	63.5	63.2	-0.5
49	2.70	2.57	-4.9	4324	4213	-2.6	63.3	63.1	-0.3
50	2.67	2.58	-3.2	4343	4280	-1.5	63.5	62.9	-0.9
51	2.90	2.86	-1.4	4378	4356	-0.5	63.1	62.8	-0.5
52	2.70	2.75	1.9	4343	4258	-2.0	63.2	63.0	-0.3
53	2.64	2.66	1.1	4325	4369	1.0	63.5	63.6	0.2
54	2.71	2.70	-0.4	4315	4278	-0.9	63.3	63.4	0.2
55	2.73	2.71	-0.5	4327	4295	-0.7	63.2	63.0	-0.3
56	2.69	2.72	1.3	4358	4312	-1.1	63.4	62.8	-0.9
X-Bar	2.704	2.698	-	4318.4	4309.4	-	63.35	63.15	-
σ	0.082	0.102	-	42.180	58.199	-	0.152	0.471	-

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DG05FNL176	10545.00	2007/4/24 5:00 PM	Nan.Yang	Gx.Xu