



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 AFB30x30x10 mm series as the right table					
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Representative Test P/N :AFB0312HA-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 °C**
 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,

$$t = 1.036 \times \text{MTTF} \times [(B_{r;c}) \div n]^{0.91} \div A_F, \text{ and } A_F = 1.5^{(T_s - T_u)/10}$$

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 Ts (°C) (Actual Test Temperature)	Unstress Temperature Tu (°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	3.38	56	2.303	3,533	11,490.0	682,964	97,566

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	2008/2/23 7:59 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	11490.0

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	6.20	1,254,685	179,241
30	5.06	1,024,446	146,349
40	3.38	682,964	97,566
50	2.25	455,309	65,044
60	1.50	303,539	43,363
70	1.00	202,360	28,909

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
DG06FNL049	13823.00	2008/12/25	Nan Yang	Zenny Lei



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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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)
3,533	2006/3/2 4:00 PM	2008/2/23 7:59 PM	56	0	11490.0
Representative Test P/N :AFB0312HA-A			Current Test Status		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination

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.	Current Spec.		Speed Spec.	Speed Spec.		Noise Spec.	Noise Spec.	
	(mA)	(mA)		(RPM)	(RPM)		(dB A)	(dB A)	
	150 Max.	150 Max.		7650-10350	7650-10350		32.0Max	32.0Max	
1	29	32	10.3	8717	8785	0.8	27.5	26.3	-4.4
2	31	34	9.7	8829	8785	-0.5	27.5	26.9	-2.2
3	29	33	13.8	8787	8919	1.5	27.8	26.5	-4.7
4	31	32	3.2	8693	8919	2.6	28.0	26.7	-4.6
5	31	33	6.5	8654	8247	-4.7	27.9	27.0	-3.2
6	29	33	13.8	8826	8247	-6.6	28.2	26.8	-5.0
7	30	33	10.0	8752	8558	-2.2	27.4	27.1	-1.1
8	30	34	13.3	8686	8886	2.3	27.3	26.1	-4.4
9	29	33	13.8	8773	8558	-2.5	27.8	27.0	-2.9
10	29	33	13.8	8821	8902	0.9	27.5	26.5	-3.6
11	32	35	9.4	8767	8517	-2.9	27.7	26.7	-3.6
12	31	33	6.5	8881	8886	0.1	27.9	26.4	-5.4
13	30	34	13.3	8727	8902	2.0	27.5	26.6	-3.3
14	32	34	6.3	8834	8389	-5.0	27.6	26.8	-2.9
15	29	33	13.8	8781	8517	-3.0	27.8	26.7	-4.0
16	29	32	10.3	8778	8389	-4.4	27.4	27.1	-1.1
17	29	30	3.4	8713	8745	0.4	27.5	26.6	-3.3
18	31	34	9.7	8569	8733	1.9	27.9	26.4	-5.4
19	31	34	9.7	8661	8861	2.3	27.5	26.8	-2.5
20	31	35	12.9	8671	8745	0.9	27.3	26.3	-3.7
21	29	32	10.3	8776	8935	1.8	27.8	26.6	-4.3
22	31	33	6.5	8797	8816	0.2	27.5	26.8	-2.5
23	29	32	10.3	8716	8861	1.7	27.7	26.4	-4.7
24	32	33	3.1	8677	8710	0.4	27.6	26.5	-4.0
25	29	32	10.3	8716	8803	1.0	27.3	26.3	-3.7
26	29	32	10.3	8780	8524	-2.9	28.0	26.8	-4.3
27	29	32	10.3	8593	8799	2.4	27.6	26.6	-3.6
28	32	33	3.1	8855	8772	-0.9	28.0	27.1	-3.2
29	29	31	6.9	8563	8799	2.8	27.5	26.3	-4.4
30	30	33	10.0	8649	8798	1.7	28.1	26.5	-5.7
31	30	33	10.0	8792	8798	0.1	27.6	26.8	-2.9
32	31	34	9.7	8667	8804	1.6	27.8	27.1	-2.5
33	30	31	3.3	8637	8948	3.6	27.2	26.7	-1.8
34	30	32	6.7	8789	8948	1.8	27.3	26.4	-3.3
35	31	35	12.9	8597	8409	-2.2	27.3	27.0	-1.1

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL049	13823.00	2008/12/25	Nan Yang	Zenny Lei



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Representative Test P/N :AFB0312HA-A			Current Test Status		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination

Equipment: 1.Oven: E24-F0032 On/Off Cycles: Every 500 hours

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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.	
	(mA)	(mA)		(RPM)	(RPM)		(dB A)	(dB A)	
	150 Max.	150 Max.		7650-10350	7650-10350		32.0Max	32.0Max	
36	30	34	13.3	8614	8804	2.2	27.6	26.3	-4.7
37	29	31	6.9	8453	8350	-1.2	27.4	26.6	-2.9
38	30	32	6.7	8614	8409	-2.4	27.8	26.4	-5.0
39	30	34	13.3	8791	8733	-0.7	27.5	27.0	-1.8
40	29	33	13.8	8888	8728	-1.8	27.6	26.3	-4.7
41	29	32	10.3	8498	8350	-1.7	27.8	27.1	-2.5
42	30	33	10.0	8617	8723	1.2	27.5	26.7	-2.9
43	29	33	13.8	8970	8723	-2.8	27.9	26.5	-5.0
44	30	33	10.0	8791	8772	-0.2	27.4	26.8	-2.2
45	31	35	12.9	8730	8772	0.5	27.3	26.6	-2.6
46	31	34	9.7	8721	8724	0.0	27.0	27.0	0.0
47	31	34	9.7	8610	8724	1.3	27.5	26.4	-4.0
48	30	33	10.0	8612	8809	2.3	27.1	26.7	-1.5
49	31	35	12.9	8650	8748	1.1	27.8	26.5	-4.7
50	29	33	13.8	8888	8688	-2.3	27.6	26.3	-4.7
51	29	33	13.8	8498	8483	-0.2	27.4	26.6	-2.9
52	30	33	10.0	8617	8710	1.1	27.3	26.4	-3.3
53	29	33	13.8	8970	9024	0.6	27.2	26.7	-1.8
54	29	32	10.3	8717	8780	0.7	27.5	26.9	-2.2
55	29	32	10.3	8829	8785	-0.5	27.4	26.5	-3.3
56	29	31	6.9	8787	8776	-0.1	27.6	27.0	-2.2
X-Bar	30.0	32.9	-	8721.2	8711.2	-	27.58	26.65	-
σ	0.990	1.119	-	111.875	187.615	-	0.259	0.264	-

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DG06FNL049	13823.00	2008/12/25	Nan.Yang	Zenny Lei