



DC FAN LIFE EXPERIMENT REPORT

Available for these models with lower speed and same physical structure. All model may be followed by CRxx or CFxx series suffixes. This test report applies to AFB70x70x25.4mm series as the right table	AFB0712VH	AFB0712J J	CHD2934J	CHD2934O	CHD2934N
	AFB0746XH	CHD2946J J	CHD2946J	CHD2946O	CHD2946N

Representative Test P/N : AFB0712VH-AF00

Equipment: 1.Oven: E24-F0056 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 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	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)
2004/5/4 10:30 AM	2004/10/27 11:16 PM	<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.

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	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	<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
DG04FNL124	759.00	2004/10/27 11:30 PM	Huiling.Fu	Even.Liu

Note: The test sample equivalent to STD, Part number: AFB0712VH-AF00.



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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	AFB0712VH	AFB0712HH	AFB0712H	AFB0712M	AFB0712L
	AFB0724VH	AFB0724HH	AFB0724H	AFB0724M	AFB0724L

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2004/5/4 10:30 AM	2004/10/27 11:16 PM	56	0	3478.0

Representative Test P/N :AFB0712VH-AF00	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-F0056 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) 0.53Max.	Current Spec. (A) 0.53Max.		Speed Spec. (RPM) 5060-5940	Speed Spec. (RPM) 5060-5940		Noise Spec. (dB A) 51.5Max	Noise Spec. (dB A) 51.5Max	
1	0.40	0.41	2.5	5545	5508	-0.7	47.5	48.9	2.9
2	0.40	0.41	2.5	5551	5471	-1.4	48.3	47.8	-1.0
3	0.40	0.42	5.0	5540	5484	-1.0	48.0	48.3	0.6
4	0.41	0.43	4.9	5691	5621	-1.2	47.2	48.5	2.8
5	0.39	0.40	2.6	5492	5484	-0.1	47.4	47.8	0.8
6	0.40	0.41	2.5	5544	5495	-0.9	47.2	47.7	1.1
7	0.40	0.41	2.5	5651	5610	-0.7	48.3	47.9	-0.8
8	0.42	0.41	-2.4	5541	5551	0.2	48.1	48.0	-0.2
9	0.41	0.42	2.4	5615	5568	-0.8	47.9	47.3	-1.3
10	0.41	0.41	0.0	5515	5833	5.8	47.3	47.9	1.3
11	0.41	0.41	0.0	5541	5590	0.9	48.0	47.5	-1.0
12	0.43	0.42	-2.3	5542	5704	2.9	47.5	48.1	1.3
13	0.41	0.41	0.0	5539	5535	-0.1	47.2	48.3	2.3
14	0.40	0.41	2.5	5611	5499	-2.0	48.4	47.7	-1.4
15	0.40	0.41	2.5	5551	5507	-0.8	48.1	49.8	3.5
16	0.40	0.41	2.5	5540	5504	-0.6	48.3	47.9	-0.8
17	0.40	0.43	7.5	5560	5505	-1.0	47.0	48.2	2.6
18	0.39	0.39	0.0	5543	5561	0.3	47.4	48.5	2.3
19	0.40	0.41	2.5	5587	5534	-0.9	48.3	49.1	1.7
20	0.40	0.43	7.5	5659	5545	-2.0	48.1	48.0	-0.2
21	0.40	0.41	2.5	5583	5613	0.5	47.4	49.3	4.0
22	0.39	0.43	10.3	5597	5592	-0.1	47.9	48.2	0.6
23	0.38	0.40	5.3	5569	5509	-1.1	48.1	49.5	2.9
24	0.41	0.42	2.4	5614	5501	-2.0	48.2	49.7	3.1
25	0.43	0.44	2.3	5533	5567	0.6	47.7	48.0	0.6
26	0.41	0.41	0.0	5542	5443	-1.8	47.9	48.2	0.6
27	0.43	0.46	7.0	5543	5676	2.4	47.5	48.3	1.7
28	0.41	0.42	2.4	5547	5603	1.0	47.2	46.7	-1.1
29	0.39	0.41	5.1	5521	5518	-0.1	47.4	48.0	1.3
30	0.39	0.40	2.6	5456	5509	1.0	48.1	48.1	0.0
31	0.40	0.40	0.0	5506	5517	0.2	47.3	47.9	1.3
32	0.43	0.45	4.7	5548	5615	1.2	47.5	48.3	1.7
33	0.40	0.41	2.5	5599	5625	0.5	47.5	48.5	2.1
34	0.40	0.40	0.0	5540	5566	0.5	48.2	48.0	-0.4
35	0.40	0.41	2.5	5539	5530	-0.2	48.3	47.7	-1.2

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL124	759.00	2004/10/27 11:30 PM	Huiling.Fu	Even.Liu



DC FAN FUNCTION TEST RECORD

FOR LIFE EXPERIMENT

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	AFB0724VH	AFB0724HH	AFB0724H	AFB0724M	AFB0724L

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Representative Test P/N :AFB0712VH-AF00	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-F0056	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) 0.53Max.	Current Spec. (A) 0.53Max.		Speed Spec. (RPM) 5060-5940	Speed Spec. (RPM) 5060-5940		Noise Spec. (dB A) 51.5Max	Noise Spec. (dB A) 51.5Max	
36	0.41	0.40	-2.4	5462	5677	3.9	47.7	47.9	0.4
37	0.41	0.41	0.0	5547	5641	1.7	47.3	48.3	2.1
38	0.39	0.41	5.1	5605	5493	-2.0	47.9	48.5	1.3
39	0.39	0.41	5.1	5505	5472	-0.6	47.6	48.3	1.5
40	0.40	0.41	2.5	5493	5507	0.3	47.0	48.1	2.3
41	0.41	0.42	2.4	5485	5498	0.2	47.2	48.5	2.8
42	0.41	0.43	4.9	5646	5619	-0.5	47.7	48.0	0.6
43	0.40	0.42	5.0	5567	5572	0.1	47.9	48.3	0.8
44	0.40	0.43	7.5	5547	5551	0.1	47.7	48.0	0.6
45	0.41	0.43	4.9	5626	5629	0.1	48.0	48.2	0.4
46	0.40	0.41	2.5	5566	5626	1.1	47.6	48.0	0.8
47	0.40	0.42	5.0	5484	5562	1.4	47.5	48.2	1.5
48	0.40	0.42	5.0	5600	5494	-1.9	48.1	48.5	0.8
49	0.41	0.42	2.4	5539	5562	0.4	48.3	48.7	0.8
50	0.39	0.41	5.1	5580	5490	-1.6	48.0	47.4	-1.3
51	0.39	0.40	2.6	5543	5431	-2.0	48.1	48.0	-0.2
52	0.40	0.41	2.5	5540	5552	0.2	48.2	48.3	0.2
53	0.40	0.41	2.5	5578	5465	-2.0	48.3	48.6	0.6
54	0.40	0.42	5.0	5578	5553	-0.4	48.0	48.2	0.4
55	0.41	0.41	0.0	5541	5604	1.1	47.5	47.7	0.4
56	0.39	0.41	5.1	5546	5555	0.2	47.4	48.1	1.5
X-Bar	0.403	0.415	-	5556.9	5556.4	-	47.76	48.20	-
σ	0.011	0.013	-	47.501	70.852	-	0.399	0.546	-

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