



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 AFB45x45x15mm series as the right table	CHD26734J D	CHD26734O D	CHD26734ND		

Representative Test P/N :AFB04512HB-F00
Equipment: 1.Oven: E24-W520

⊙ **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%), and

Stress/Elevated Temperature T _s (°C) (Actual Test Temperature)	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	3,478	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)
2006/9/14 8:30 AM	2007/2/19 7:46 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 (°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
 Accept
 Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2006078	313.50	2007/2/19 8:00 AM	EILEEN.LEE	ANGLER.LIU



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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CHD26734J D	CHD26734O D	CHD26734ND

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	2006/9/14 8:30 AM	2007/2/19 7:46 AM	56	0	3478.0

Representative Test P/N :AFB04512HB-F00	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> process (exceed requested)	<input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-W520		0		

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 Check.	
	(mA)	(mA)		(RPM)	(RPM)		(dB A)	(dB A)	
	170max.	170max.		6300±8%	6300-15%		37.5max.	37.5+3max.	
1	123	124	0.8	6341	6566	3.5	33.6	37.3	11.0
2	122	121	0.8	6301	6579	4.4	32.8	35.6	8.5
3	126	120	4.8	6258	6539	4.5	32.5	34.8	7.1
4	126	122	3.2	6119	6445	5.3	32.4	35.2	8.6
5	125	144	15.2	6161	5477	11.1	32.4	34.9	7.7
6	128	120	6.3	6138	6450	5.1	32.5	35.1	8.0
7	122	120	1.6	6337	6553	3.4	32.6	35.2	8.0
8	126	125	0.8	6161	6459	4.8	32.2	34.8	8.1
9	126	125	0.8	6157	6464	5.0	32.3	34.9	8.0
10	124	121	2.4	6356	6446	1.4	33.5	35.6	6.3
11	124	121	2.4	6157	6323	2.7	32.8	35.1	7.0
12	124	122	1.6	6187	6521	5.4	33.8	35.7	5.6
13	124	122	1.6	6183	6409	3.7	33.7	34.7	3.0
14	124	120	3.2	6248	6453	3.3	33.9	35.5	4.7
15	125	122	2.4	6238	6540	4.8	33.8	34.9	3.3
16	124	122	1.6	6108	6432	5.3	33.0	33.9	2.7
17	125	125	0.0	6183	6433	4.0	33.1	34.6	4.5
18	125	129	3.2	6207	6360	2.5	33.7	35.2	4.5
19	122	120	1.6	6267	6461	3.1	33.8	35.7	5.6
20	124	120	3.2	6182	6496	5.1	33.4	35.7	6.9
21	124	121	2.4	6393	6611	3.4	33.9	34.8	2.7
22	125	122	2.4	6285	6528	3.9	33.0	35.6	7.9
23	124	127	2.4	6289	6440	2.4	33.7	35.9	6.5
24	126	119	5.6	6203	6419	3.5	33.9	37.0	9.1
25	125	121	3.2	6131	6385	4.1	32.5	35.7	9.8
26	126	121	4.0	6131	6425	4.8	33.0	35.5	7.6
27	124	123	0.8	6183	6501	5.1	33.9	35.1	3.5
28	127	122	3.9	6195	6497	4.9	33.1	35.0	5.7
29	123	123	0.0	6179	6438	4.2	33.8	34.7	2.7
30	123	126	2.4	6271	6478	3.3	33.4	35.0	4.8
31	126	122	3.2	6165	6435	4.4	33.3	34.9	4.8
32	125	122	2.4	6165	6522	5.8	33.7	36.0	6.8
33	126	123	2.4	6195	6368	2.8	33.2	35.7	7.5
34	124	120	3.2	6211	6515	4.9	33.0	34.7	5.2
35	123	122	0.8	6361	6510	2.3	32.6	35.0	7.4

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2006078	313.50	2007/2/19 8:00 AM	EILEEN.LEE	ANGLER.LIU



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 AFB45x45x15mm series as the right table	AFB04512HB	AFB04512MB	AFB04512LB		

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	2006/9/14 8:30 AM	2007/2/19 7:46 AM	56	0	3478.0

Representative Test P/N :AFB04512HB-F00	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-W520 0

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. (mA)	Current Spec. (mA)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Check. (dB A)	
	170max.	170max.		6300±8%	6300-15%		37.5max.	37.5+3max.	
36	126	121	4.0	6157	6409	4.1	33.0	35.8	8.5
37	122	121	0.8	6275	6443	2.7	32.6	34.7	6.4
38	125	120	4.0	6165	6430	4.3	33.3	35.6	6.9
39	126	120	4.8	6207	6519	5.0	33.0	35.8	8.5
40	125	123	1.6	6218	6450	3.7	33.1	34.9	5.4
41	127	121	4.7	6169	6415	4.0	33.2	35.7	7.5
42	125	123	1.6	5988	6400	6.9	33.1	35.2	6.3
43	124	122	1.6	6325	6482	2.5	34.1	34.9	2.3
44	121	120	0.8	6150	6512	5.9	33.9	35.7	5.3
45	124	123	0.8	6173	6604	7.0	33.5	34.8	3.9
46	125	121	3.2	6127	6389	4.3	33.3	34.7	4.2
47	124	118	4.8	6097	6432	5.5	33.2	35.1	5.7
48	124	123	0.8	6226	6537	5.0	32.4	34.9	7.7
49	126	122	3.2	6119	6516	6.5	32.6	35.6	9.2
50	125	126	0.8	6179	6383	3.3	33.1	35.1	6.0
51	123	120	2.4	6222	6505	4.5	33.6	34.7	3.3
52	123	121	1.6	6301	6463	2.6	32.7	35.2	7.6
53	124	122	1.6	6211	6521	5.0	32.2	35.0	8.7
54	124	123	0.8	6234	6523	4.6	32.3	35.3	9.3
55	124	121	2.4	6187	6450	4.3	33.0	36.2	9.7
56	123	124	0.8	6230	6462	3.7	32.5	35.7	9.8
Mean (X-Standard)	124.5	122.4	-	6207.3	6451.3	-	33.13	35.28	-
	1.414	3.581	-	75.714	147.313	-	0.538	0.575	-

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