



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 AFB90x90x20 mm series as the right table	AFB0912VHD	AFB0912J J D	CHD2; 34J F	CHD2; 34O F	CHD2; 34NF
	AFB0946XHD	CHD2; 46J J F	CHD2; 46J F	CHD2; 46O F	CHD2; 46NF
	""				
	""				

Representative Test P/N :AFB0912VHD-F00	
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%), 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	3,478	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)
2003/10/24 2:00 PM	2004/3/26 3:16 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. 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	<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
DG03FNL156	219.50	2004/3/26 3:30 PM	Huiling.Fu	Even.Liu

Note: The test sample equivalent to STD, Part umber: AFB0912VHD-F00.



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 AFB90x90x20 mm series as the right table

AFB0912VHD	AFB0912HHH	AFB0912HD	AFB0912MD	AFB0912LD
AFB0924VHD	AFB0924HHH	AFB0924HD	AFB0924MD	AFB0924LD

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2003/10/24 2:00 PM	2004/3/26 3:16 PM	56	0	3478.0

Representative Test P/N :AFB0912VHD-F00	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
---	---------------------	-------------------------------------	--	---

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) 0.34Max.	Current Spec. (A) 0.34Max.		Speed Spec. (RPM) 3036-3564	Speed Spec. (RPM) 3036-3564		Noise Spec. (dB A) 41.5+3Max	Noise Spec. (dB A) 41.5+3Max	
1	0.24	0.24	0.0	3324	3359	1.1	41.9	41.7	-0.5
2	0.26	0.26	0.0	3420	3462	1.2	41.3	41.7	1.0
3	0.25	0.24	-4.0	3413	3452	1.1	41.1	41.3	0.5
4	0.24	0.24	0.0	3465	3500	1.0	41.5	40.9	-1.4
5	0.24	0.24	0.0	3431	3473	1.2	41.6	41.1	-1.2
6	0.25	0.25	0.0	3463	3470	0.2	41.3	41.4	0.2
7	0.24	0.24	0.0	3453	3468	0.4	41.2	41.3	0.2
8	0.25	0.25	0.0	3378	3405	0.8	41.5	41.0	-1.2
9	0.24	0.24	0.0	3407	3434	0.8	41.7	40.8	-2.2
10	0.24	0.24	0.0	3377	3415	1.1	41.3	40.8	-1.2
11	0.25	0.25	0.0	3443	3490	1.4	41.4	41.3	-0.2
12	0.24	0.25	4.2	3436	3460	0.7	41.5	41.5	0.0
13	0.24	0.24	0.0	3376	3425	1.5	41.1	41.0	-0.2
14	0.24	0.24	0.0	3435	3463	0.8	41.6	41.0	-1.4
15	0.24	0.25	4.2	3406	3437	0.9	41.3	41.5	0.5
16	0.24	0.24	0.0	3395	3450	1.6	41.5	41.0	-1.2
17	0.25	0.25	0.0	3380	3427	1.4	41.7	40.9	-1.9
18	0.24	0.24	0.0	3397	3465	2.0	41.6	40.5	-2.6
19	0.24	0.25	4.2	3457	3473	0.5	41.6	41.2	-1.0
20	0.24	0.24	0.0	3356	3407	1.5	41.8	40.9	-2.2
21	0.24	0.24	0.0	3421	3447	0.8	41.5	40.4	-2.7
22	0.24	0.25	4.2	3397	3413	0.5	41.4	40.7	-1.7
23	0.24	0.24	0.0	3414	3444	0.9	41.2	41.0	-0.5
24	0.25	0.25	0.0	3394	3434	1.2	41.7	41.6	-0.2
25	0.24	0.25	4.2	3411	3451	1.2	41.6	41.2	-1.0
26	0.25	0.24	-4.0	3467	3485	0.5	41.7	41.5	-0.5
27	0.25	0.25	0.0	3424	3493	2.0	41.3	40.9	-1.0
28	0.24	0.24	0.0	3424	3475	1.5	41.5	41.1	-1.0
29	0.24	0.24	0.0	3376	3432	1.7	41.4	41.3	-0.2
30	0.25	0.25	0.0	3420	3459	1.1	41.3	41.6	0.7
31	0.24	0.24	0.0	3391	3413	0.6	41.6	41.7	0.2
32	0.25	0.25	0.0	3434	3457	0.7	41.3	41.2	-0.2
33	0.24	0.24	0.0	3382	3422	1.2	41.5	40.9	-1.4
34	0.24	0.24	0.0	3382	3435	1.6	41.7	40.8	-2.2
35	0.25	0.25	0.0	3450	3477	0.8	41.6	41.3	-0.7

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG03FNL156	219.50	2004/3/26 3:30 PM	Huiling.Fu	Even.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 AFB90x90x20 mm series as the right table	AFB0912VHD	AFB0912HHH	AFB0912HD	AFB0912MD	AFB0912LD
	AFB0924VHD	AFB0924HHH	AFB0924HD	AFB0924MD	AFB0924LD

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2003/10/24 2:00 PM	2004/3/26 3:16 PM	56	0	3478.0
Representative Test P/N :AFB0912VHD-F00			Current Test Status <input type="checkbox"/> In process		<input type="checkbox"/> In process (exceed requested)
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)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	0.34Max.	0.34Max.		3036-3564	3036-3564		41.5+3Max	41.5+3Max	
36	0.27	0.26	-3.7	3493	3502	0.3	41.4	41.0	-1.0
37	0.25	0.25	0.0	3437	3463	0.8	41.6	40.9	-1.7
38	0.24	0.25	4.2	3327	3400	2.2	41.5	40.8	-1.7
39	0.25	0.25	0.0	3452	3470	0.5	41.3	41.2	-0.2
40	0.24	0.24	0.0	3422	3447	0.7	41.4	41.3	-0.2
41	0.25	0.25	0.0	3434	3471	1.1	41.0	41.0	0.0
42	0.25	0.25	0.0	3436	3465	0.8	41.5	41.6	0.2
43	0.24	0.24	0.0	3376	3400	0.7	41.5	41.7	0.5
44	0.26	0.27	3.8	3466	3474	0.2	41.7	41.0	-1.7
45	0.25	0.25	0.0	3386	3415	0.9	41.9	41.2	-1.7
46	0.26	0.26	0.0	3481	3507	0.7	41.7	41.3	-1.0
47	0.26	0.26	0.0	3450	3478	0.8	41.5	41.6	0.2
48	0.25	0.25	0.0	3421	3466	1.3	41.3	41.5	0.5
49	0.24	0.24	0.0	3467	3472	0.1	42.2	41.4	-1.9
50	0.25	0.25	0.0	3451	3458	0.2	41.6	41.3	-0.7
51	0.25	0.24	-4.0	3420	3463	1.3	41.7	41.3	-1.0
52	0.24	0.25	4.2	3420	3471	1.5	41.5	40.6	-2.2
53	0.23	0.23	0.0	3386	3437	1.5	41.5	40.7	-1.9
54	0.25	0.25	0.0	3450	3483	1.0	41.8	40.8	-2.4
55	0.26	0.27	3.8	3421	3459	1.1	41.7	41.5	-0.5
56	0.25	0.25	0.0	3443	3490	1.4	41.7	41.0	-1.7
X-Bar	0.246	0.247	-	3417.7	3452.3	-	41.51	41.16	-
σ	0.008	0.008	-	35.652	29.822	-	0.219	0.326	-

QE File No.	Time-out for function test or others (hrs)	Issued Date	Reported By	Approved By
DG03FNL156	219.50	2004/3/26 3:30 PM	Huiling.Fu	Even.Liu