



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 AFC70x70x15 mm series as the right table	AFC0712DB-6Y33			
Representative Test P/N :AFC0712DB-F00				
Equipment: 1.Oven: E24-F0054			On/Off Cycles: Every 500 hours	

© **L₁₀ Expectancy: 70,000** hours minimum @ fan rated voltage and the temperature of 40℃
According to the equation for **Weibull distribution**, $MTTF \cong 7 \times L_{10} = 490,000$ 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,

$$t = 1.036 \times MTTF \times [(B_{r;c}) \div n]^{0.91} \div A_F, \text{ and } A_F = 2^{(T_s - T_u)/10}$$

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)
60	40	4.00	56	2.303	6,956	6,956.0	490,031	70,004

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2004/8/20 4:30 PM	2005/7/28 1:33 PM	☐ In process	☐ In process (exceed requested)	☒ Termination	6956.0

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	11.31	1,386,017	198,002
30	8.00	980,062	140,009
40	4.00	490,031	70,004
50	2.00	245,015	35,002
60	1.00	122,508	17,501

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
DG04FNL227	1249.50	2005/7/28 2:00 PM	Guie.Lin	Gx.Xu



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)				
6,956	2004/8/20 4:30 PM	2005/7/28 1:33 PM	56	0	6956.0				
Representative Test P/N :AFC0712DB-F00			Current Test Status	☐ In process	☐ In process (exceed requested)	☒ Termination			
Equipment: 1.Oven: E24-F0054				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)	
	0.41Max.	0.41Max.		5520-6480	5520-6480		50.5Max	50.5Max	
1	0.35	0.35	0.0	6068	6098	0.5	46.7	47.0	0.6
2	0.35	0.35	0.0	6175	6045	-2.1	46.5	46.8	0.6
3	0.35	0.35	0.0	6045	6062	0.3	46.7	46.7	0.0
4	0.35	0.35	0.0	6081	6124	0.7	46.3	46.5	0.4
5	0.35	0.35	0.0	6122	6134	0.2	46.2	46.9	1.5
6	0.35	0.35	0.0	6055	6072	0.3	47.0	47.3	0.6
7	0.35	0.35	0.0	6075	6045	-0.5	46.6	47.0	0.9
8	0.35	0.35	0.0	6092	6088	-0.1	46.9	47.4	1.1
9	0.35	0.35	0.0	6165	6125	-0.6	47.6	47.7	0.2
10	0.35	0.35	0.0	6124	6078	-0.8	47.2	47.3	0.2
11	0.35	0.35	0.0	6125	6175	0.8	46.8	47.1	0.6
12	0.34	0.34	0.0	6041	6021	-0.3	46.8	47.0	0.4
13	0.35	0.35	0.0	6020	6072	0.9	46.6	46.7	0.2
14	0.35	0.35	0.0	6084	6035	-0.8	46.5	46.9	0.9
15	0.35	0.35	0.0	6019	6088	1.1	46.2	46.5	0.6
16	0.35	0.35	0.0	5946	6009	1.1	47.0	47.2	0.4
17	0.35	0.35	0.0	6063	6098	0.6	47.1	47.3	0.4
18	0.33	0.33	0.0	6048	6052	0.1	46.3	46.5	0.4
19	0.37	0.36	-2.7	6003	6048	0.7	46.8	47.0	0.4
20	0.35	0.34	-2.9	6017	6015	0.0	46.1	46.4	0.7
21	0.35	0.35	0.0	6072	6098	0.4	46.5	46.8	0.6
22	0.35	0.36	2.9	6046	6042	-0.1	46.2	46.4	0.4
23	0.34	0.34	0.0	6045	6082	0.6	46.6	46.7	0.2
24	0.33	0.33	0.0	5940	6005	1.1	46.5	46.8	0.6
25	0.35	0.35	0.0	6024	6029	0.1	46.3	46.6	0.6
26	0.35	0.35	0.0	6072	6098	0.4	46.2	46.5	0.6
27	0.35	0.35	0.0	5995	6022	0.5	46.7	47.0	0.6
28	0.36	0.36	0.0	6093	6172	1.3	47.0	47.3	0.6
29	0.34	0.34	0.0	6049	6018	-0.5	46.5	46.9	0.9
30	0.35	0.35	0.0	6063	6060	0.0	46.4	46.8	0.9
31	0.35	0.35	0.0	6042	6000	-0.7	46.8	47.1	0.6
32	0.34	0.34	0.0	6030	6025	-0.1	46.7	47.0	0.6
33	0.36	0.36	0.0	6047	6089	0.7	46.4	46.7	0.6
34	0.35	0.35	0.0	6063	6029	-0.6	46.8	47.2	0.9
35	0.34	0.34	0.0	6017	6097	1.3	46.5	46.8	0.6
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG04FNL227	1249.50		2005/7/28 2:00 PM		Guie.Lin		Gx.Xu		



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Equipment: 1.Oven: E24-F0054				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) 0.41Max.	Current Spec. (A) 0.41Max.		Speed Spec. (RPM) 5520-6480	Speed Spec. (RPM) 5520-6480		Noise Spec. (dB A) 50.5Max	Noise Spec. (dB A) 50.5Max	
36	0.35	0.35	0.0	6175	6198	0.4	47.1	47.0	-0.2
37	0.36	0.35	-2.8	6014	6190	2.9	47.2	47.0	-0.4
38	0.34	0.34	0.0	6002	6104	1.7	46.8	47.2	0.9
39	0.35	0.36	2.9	6115	6112	0.0	46.9	46.7	-0.4
40	0.34	0.34	0.0	6075	6125	0.8	46.2	47.1	1.9
41	0.35	0.35	0.0	6034	6187	2.5	46.2	47.1	1.9
42	0.34	0.34	0.0	6029	6120	1.5	46.8	46.9	0.2
43	0.35	0.34	-2.9	6045	6048	0.0	46.7	47.0	0.6
44	0.35	0.35	0.0	6089	6025	-1.1	46.7	47.3	1.3
45	0.35	0.35	0.0	6064	6072	0.1	47.1	46.5	-1.3
46	0.36	0.35	-2.8	6197	6178	-0.3	46.3	46.8	1.1
47	0.35	0.35	0.0	6046	6099	0.9	46.5	47.2	1.5
48	0.34	0.34	0.0	6009	6002	-0.1	46.8	46.7	-0.2
49	0.33	0.33	0.0	6090	6117	0.4	46.3	47.0	1.5
50	0.34	0.33	-2.9	6075	6078	0.0	46.5	47.1	1.3
51	0.35	0.35	0.0	6087	6070	-0.3	46.5	46.7	0.4
52	0.33	0.33	0.0	6002	6028	0.4	46.5	46.8	0.6
53	0.34	0.34	0.0	6071	6069	0.0	46.4	47.2	1.7
54	0.35	0.35	0.0	6063	6055	-0.1	46.8	46.7	-0.2
55	0.34	0.34	0.0	6043	6047	0.1	46.5	47.1	1.3
56	0.34	0.34	0.0	6093	6152	1.0	46.7	47.0	0.6
X-Bar	0.347	0.347	-	6060.2	6078.7	-	46.63	46.93	-
σ	0.008	0.008	-	50.699	52.457	-	0.313	0.277	-
QE File No.	Time-out for function test or others (hrs)		Issued Date		Reported By		Approved By		
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