



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 AFB 120x120x38.0 mm series as the right table

AFB1224GHEXUL

Representative Test P/N : AFB1224GHE-BJ2U

Equipment: 1.Oven: E24-F0028

◎ **L₁₀ Expectancy:** **35,000** hours minimum @ fan rated voltage and the temperature of 60°C

According to the equation for Weibull distribution,

$$MTTF \cong 7 \times L_{10} = 245,000 \text{ hours}$$

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 60 °C (hours)	Verified L ₁₀ 60 °C (hours)
85	60	5.66	56	2.303	2,459	7,360.0	733,258	104,751

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2013/10/17 2:00 PM	2014/6/26 7:09 PM	☐ In process	☐ In process (exceed requested)	☒ Termination	7360.0

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	64.00	8,295,865	1,185,124
30	45.25	5,866,062	838,009
40	22.63	2,933,031	419,004
50	11.31	1,466,516	209,502
60	5.66	733,258	104,751
70	2.83	366,629	52,376
85	1.00	129,623	18,518

Fan permission criteria for the measurement after test :

1. Speed can not drop of $\geq 15\%$ below the original measured rpm.
2. Current cannot increase > 15% of original measure current.
3. Noise cannot >3dB over the original measure noise.

Test Result



Accept



Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG13FNL149	4126.50	2015/6/10	Loly.Wang	Tim.Yi

BGN (dBA) : 16.0

Temp (°C) : 23.7



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)				
2,459	2013/10/17 2:00 PM	2014/6/26 7:09 PM	56	0	7360.0				
Representative Test P/N : AFB1224GHE-BJ2U			Current Test Status	☐ In process	☐ In process (exceed requested)	☒ Termination			
Equipment: 1.Oven: E24-F0028									
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (A) 1.60 Max.	Final Test Current Spec. (A) 1.60 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 4680-5720	Final Test Speed Spec. (RPM) 4680-5720	Deviation (%)	Initial Test Noise Spec. (dB A) 66.0 Max	Final Test Noise Spec. (dB A) 66.0 Max	Deviation 3 dBMax.
1	1.18	1.18	-0.3	5115	5299	3.6	60.2	60.7	0.5
2	1.21	1.23	2.1	5197	5199	0.0	61.4	61.7	0.3
3	1.19	1.17	-1.3	5200	5269	1.3	60.7	61.1	0.4
4	1.14	1.14	0.8	5092	5265	3.4	60.8	60.9	0.1
5	1.23	1.12	-8.6	5273	5282	0.2	61.5	61.3	-0.2
6	1.22	1.16	-4.7	5208	5115	-1.8	60.9	61.5	0.6
7	1.21	1.21	-0.4	5185	5179	-0.1	61.3	61.7	0.4
8	1.23	1.23	0.2	5493	5258	-4.3	60.3	61.1	0.8
9	1.20	1.27	5.4	5178	5152	-0.5	60.5	61.3	0.8
10	1.14	1.25	9.5	5324	5105	-4.1	61.1	60.8	-0.3
11	1.17	1.20	2.7	5166	5144	-0.4	60.6	61.5	0.9
12	1.22	1.22	-0.5	5185	5258	1.4	60.8	61.7	0.9
13	1.16	1.23	5.9	5090	5286	3.9	61.4	60.8	-0.6
14	1.24	1.14	-8.4	5223	5154	-1.3	60.2	61.1	0.9
15	1.20	1.22	1.2	5202	5178	-0.5	60.4	61.4	1.0
16	1.23	1.19	-3.1	5200	5235	0.7	60.6	60.9	0.3
17	1.17	1.20	3.1	5150	5218	1.3	61.1	61.6	0.5
18	1.12	1.19	6.3	5215	5264	0.9	61.3	60.7	-0.6
19	1.22	1.22	-0.2	5254	5235	-0.4	60.8	61.0	0.2
20	1.15	1.16	0.9	5277	5144	-2.5	61.4	61.2	-0.2
21	1.20	1.16	-3.7	5208	5286	1.5	60.2	61.4	1.2
22	1.19	1.22	2.3	5169	5227	1.1	60.4	61.6	1.2
23	1.22	1.24	1.1	5194	5277	1.6	61.0	60.7	-0.3
24	1.19	1.24	4.2	5102	5245	2.8	60.6	61.0	0.4
25	1.21	1.19	-1.2	5141	5269	2.5	61.3	61.2	-0.1
26	1.23	1.21	-1.6	5184	5219	0.7	60.8	61.4	0.6
27	1.26	1.22	-3.0	5239	5229	-0.2	61.5	60.9	-0.6
28	1.15	1.24	7.8	5226	5237	0.2	60.7	61.6	0.9
29	1.27	1.24	-2.6	5223	5291	1.3	60.3	61.0	0.7
30	1.18	1.23	4.0	5720	5138	-10.2	60.5	60.8	0.3
31	1.16	1.22	5.4	5108	5285	3.5	61.0	61.2	0.2
32	1.11	1.15	3.3	5271	5201	-1.3	61.2	61.4	0.2
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG13FNL149	4126.50		2015/6/10		Loly.Wang		Tim.Yi		



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)
2,459	2013/10/17 2:00 PM	2014/6/26 7:09 PM	56	0	7360.0

Representative Test P/N : AFB1224GHE-BJ2U	Current Test Status	☐ In process	☐ In process (exceed requested)	☒ Termination
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Equipment: 1.Oven: E24-F0028	
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Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 1.60 Max.	Final Test Current Spec. (A) 1.60 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 4680-5720	Final Test Speed Spec. (RPM) 4680-5720	Deviation (%)	Initial Test Noise Spec. (dB A) 66.0 Max	Final Test Noise Spec. (dB A) 66.0 Max	Deviation 3 dBMax.
33	1.20	1.28	6.4	5174	5214	0.8	60.6	61.6	1.0
34	1.14	1.21	6.2	5266	5098	-3.2	61.1	60.7	-0.4
35	1.23	1.21	-1.1	5163	5242	1.5	60.2	61.0	0.8
36	1.21	1.12	-7.3	5153	5233	1.6	60.4	61.2	0.8
37	1.24	1.20	-2.6	5161	5018	-2.8	61.0	61.4	0.4
38	1.23	1.24	1.2	5207	5200	-0.1	61.2	60.9	-0.3
39	1.22	1.17	-4.2	5308	5136	-3.2	60.7	61.6	0.9
40	1.25	1.19	-4.3	5184	5197	0.3	61.3	61.0	-0.3
41	1.18	1.24	5.2	5105	5077	-0.5	61.5	61.2	-0.3
42	1.17	1.19	2.0	5111	5354	4.8	60.3	61.3	1.0
43	1.19	1.27	6.3	5127	5085	-0.8	60.5	60.7	0.2
44	1.21	1.18	-2.9	5302	5171	-2.5	61.0	61.5	0.5
45	1.19	1.23	2.9	5155	5124	-0.6	61.2	61.7	0.5
46	1.22	1.21	-1.0	5148	5100	-0.9	60.7	60.8	0.1
47	1.18	1.24	5.2	5112	5116	0.1	60.9	61.1	0.2
48	1.23	1.22	-0.2	5166	5235	1.3	61.5	61.3	-0.2
49	1.22	1.24	2.4	5115	5167	1.0	60.3	60.9	0.6
50	1.15	1.21	5.7	5309	5102	-3.9	61.1	61.5	0.4
51	1.19	1.24	4.2	5030	5194	3.3	60.5	61.7	1.2
52	1.18	1.25	5.9	5336	5201	-2.5	60.2	61.1	0.9
53	1.18	1.24	4.7	5102	5234	2.6	60.7	61.3	0.6
54	1.23	1.26	2.4	5176	5138	-0.7	61.4	60.8	-0.6
55	1.20	1.27	5.8	5313	5134	-3.4	60.9	61.5	0.6
56	1.19	1.28	7.2	5092	5124	0.6	61.2	61.7	0.5
X-Bar	1.2	1.2	-	5202.3	5197.1	-	60.84	61.2	-
σ	0.035	0.038	-	106.351	70.087	-	0.412	0.323	-

QE File No.	Time-out for function test or others (hrs)	Issued Date	Reported By	Approved By
DG13FNL149	4126.50	2015/6/10	Loly.Wang	Tim.Yi