



# 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 120x120x25.4 mm series as the right table	AFB1212HJ-00				
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**Representative Test P/N : AFB1212HJ-00G14**

**Equipment: 1.Oven: E24-T0161**

◎ **L<sub>10</sub> Expectancy: 60,000 hours minimum @ fan rated voltage and the temperature of 40 °C**  
 According to the equation for **Weibull distribution**, **MTTF ≈ 7×L10 = 420,000 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<sub>r,c</sub>) 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 T <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°C)	Acceleration Factor A <sub>F</sub>	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B <sub>r,c</sub>	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
70	40	8.00	100	2.303	1,759	1,466.0	350,088	50,013

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2020/3/10 7:00 PM	2020/9/7 4:45 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	1466.0

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' L<sub>10</sub> 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 <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	22.63	990,197	141,457
30	16.00	700,175	100,025
40	8.00	350,088	50,013
50	4.00	175,044	25,006
60	2.00	87,522	12,503
70	1.00	43,761	6,252

- Fan permission criteria for the measurement after test :
1. Speed can not drop of ≥ 15% below the original measured rpm.
  2. Current cannot increase > 15% of original measure current.
  3. Noise cannot >3dB over the original measure noise.

<b>Test Result</b>	<input checked="" type="checkbox"/> <b>Accept</b> <input type="checkbox"/> <b>Reject</b>
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG20FNL013	2571.00	2020/8/26	Loly.Wang	Tim.Yi

BGN (dBA) : 15.9

Temp (°C) : 25.0



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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AFB1212HJ-00

<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>
1,759	2020/3/10 7:00 PM	2020/9/7 4:45 AM	100	0	<b>1466.0</b>
Representative Test P/N : AFB1212HJ-00G14			<b>Current Test Status</b>		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0161					

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) <b>1.2 Max.</b>	Final Test Current Spec. (A) <b>1.2 Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>3870-4730</b>	Final Test Speed Spec. (RPM) <b>3870-4730</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>59.0 Max</b>	Final Test Noise Spec. (dB A) <b>59.0 Max</b>	Deviation <b>3 dBMax.</b>
1	0.64	0.65	1.1	4225	4240	0.4	55.9	56.0	0.1
2	0.67	0.68	0.4	4265	4273	0.2	55.6	55.9	0.3
3	0.65	0.66	1.4	4321	4230	-2.1	56.1	55.5	-0.6
4	0.63	0.64	2.7	4225	4201	-0.6	55.9	55.6	-0.3
5	0.65	0.63	-3.8	4080	4227	3.6	55.9	55.3	-0.6
6	0.67	0.58	-13.8	4141	4534	9.5	55.7	56.2	0.5
7	0.69	0.66	-3.8	4091	4277	4.5	56.0	55.4	-0.6
8	0.70	0.67	-4.4	4148	4216	1.6	55.9	55.6	-0.3
9	0.67	0.64	-3.8	4080	4215	3.3	56.0	55.5	-0.5
10	0.67	0.65	-3.3	4218	4246	0.7	55.9	55.6	-0.3
11	0.68	0.65	-4.1	4076	4206	3.2	55.6	55.8	0.2
12	0.73	0.69	-5.7	4072	4271	4.9	55.8	55.4	-0.4
13	0.72	0.69	-3.4	4039	4193	3.8	55.7	55.2	-0.5
14	0.68	0.63	-7.5	4085	4236	3.7	55.9	55.6	-0.3
15	0.68	0.64	-5.2	4090	4326	5.8	56.0	55.4	-0.6
16	0.71	0.66	-6.7	4115	4268	3.7	56.1	55.8	-0.3
17	0.70	0.67	-4.6	4087	4246	3.9	55.8	55.7	-0.1
18	0.68	0.63	-7.7	4068	4247	4.4	55.9	55.5	-0.4
19	0.66	0.64	-3.5	4089	4235	3.6	56.0	55.7	-0.3
20	0.70	0.66	-5.9	4093	4227	3.3	55.6	55.3	-0.3
21	0.69	0.67	-3.2	4034	4219	4.6	56.1	55.6	-0.5
22	0.67	0.64	-4.2	4175	4223	1.1	55.9	55.3	-0.6
23	0.66	0.63	-4.2	4049	4241	4.7	56.0	55.5	-0.5
24	0.69	0.67	-2.7	4189	4191	0.0	56.2	55.7	-0.5
25	0.70	0.67	-3.9	4083	4241	3.9	56.1	55.6	-0.5
26	0.69	0.64	-6.8	4073	4253	4.4	56.3	55.7	-0.6
27	0.69	0.67	-3.0	4118	4225	2.6	56.1	55.7	-0.4
28	0.69	0.65	-4.8	4175	4221	1.1	55.9	55.8	-0.1
29	0.67	0.63	-4.8	4047	4257	5.2	55.8	55.6	-0.2
30	0.71	0.66	-6.9	4122	4294	4.2	56.0	55.6	-0.4
31	0.67	0.64	-3.7	4056	4244	4.6	56.0	55.3	-0.7
32	0.72	0.66	-8.1	4110	4276	4.0	55.9	55.3	-0.6

<b>QE File No.</b>	<b>Time-out for function test or others (hours)</b>	<b>Issued Date</b>	<b>Reported By</b>	<b>Approved By</b>
DG20FNL013	2571.00	2020/8/26	Loly.Wang	Tim.Yi



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>
1,759	2020/3/10 7:00 PM	2020/9/7 4:45 AM	100	0	<b>1466.0</b>
Representative Test P/N : AFB1212HJ-00G14			<b>Current Test Status</b>		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0161					

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A)	Final Test Current Spec. (A)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Spec. (dB A)	Deviation 3 dBMax.
	<b>1.2 Max.</b>	<b>1.2 Max.</b>		<b>3870-4730</b>	<b>3870-4730</b>		<b>59.0 Max</b>	<b>59.0 Max</b>	
33	0.70	0.67	-3.6	4078	4218	3.4	56.0	55.9	-0.1
34	0.72	0.66	-7.6	4106	4247	3.4	55.8	55.8	0.0
35	0.68	0.65	-3.8	4081	4213	3.2	55.7	55.6	-0.1
36	0.68	0.65	-4.7	4125	4291	4.0	56.1	55.8	-0.3
37	0.68	0.65	-5.1	4079	4283	5.0	55.8	55.9	0.1
38	0.74	0.70	-6.0	4123	4352	5.6	55.9	56.0	0.1
39	0.73	0.70	-3.3	4180	4325	3.5	56.1	55.3	-0.8
40	0.70	0.64	-7.7	4064	4252	4.6	55.7	55.6	-0.1
41	0.68	0.65	-3.3	4081	4188	2.6	55.9	55.7	-0.2
42	0.73	0.70	-4.1	4083	4149	1.6	56.0	55.4	-0.6
43	0.68	0.65	-4.7	4055	4208	3.8	55.9	55.7	-0.2
44	0.67	0.63	-5.5	4138	4258	2.9	56.0	55.5	-0.5
45	0.70	0.68	-3.1	4146	4246	2.4	55.6	55.9	0.3
46	0.66	0.61	-7.9	4071	4243	4.2	55.8	55.3	-0.5
47	0.67	0.65	-3.0	4107	4228	2.9	55.9	55.3	-0.6
48	0.67	0.64	-4.7	4181	4203	0.5	56.1	55.6	-0.5
49	0.68	0.65	-4.0	4096	4223	3.1	56.0	55.9	-0.1
50	0.70	0.65	-6.3	4089	4219	3.2	56.0	55.8	-0.2
51	0.66	0.65	-1.2	4119	4224	2.5	56.2	55.5	-0.7
52	0.72	0.67	-7.5	4079	4256	4.3	55.9	55.6	-0.3
53	0.65	0.63	-3.1	4104	4231	3.1	55.6	55.8	0.2
54	0.70	0.65	-7.0	4072	4202	3.2	56.2	55.6	-0.6
55	0.67	0.65	-4.3	4087	4278	4.7	55.9	55.4	-0.5
56	0.71	0.66	-6.6	4105	4228	3.0	56.0	55.9	-0.1
57	0.64	0.62	-2.5	4072	4246	4.3	55.7	55.4	-0.3
58	0.74	0.70	-5.5	4094	4258	4.0	56.2	55.7	-0.5
59	0.65	0.63	-3.1	4054	4188	3.3	55.7	55.4	-0.3
60	0.66	0.63	-5.7	4042	4168	3.1	55.5	55.5	0.0
61	0.67	0.64	-4.3	4064	4216	3.7	55.8	55.5	-0.3
62	0.68	0.67	-2.3	4144	4229	2.1	55.6	55.6	0.0
63	0.68	0.64	-5.3	4035	4264	5.7	55.9	55.7	-0.2
64	0.72	0.67	-6.3	4085	4244	3.9	55.5	55.3	-0.2

<b>QE File No.</b>	<b>Time-out for function test or others (hrs)</b>	<b>Issued Date</b>	<b>Reported By</b>	<b>Approved By</b>
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<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>
1,759	2020/3/10 7:00 PM	2020/9/7 4:45 AM	100	0	<b>1466.0</b>
Representative Test P/N : AFB1212HJ-00G14			<b>Current Test Status</b>		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0161					

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 1.2 Max.	Final Test Current Spec. (A) 1.2 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 3870-4730	Final Test Speed Spec. (RPM) 3870-4730	Deviation (%)	Initial Test Noise Spec. (dB A) 59.0 Max	Final Test Noise Spec. (dB A) 59.0 Max	Deviation 3 dBMax.
65	0.68	0.66	-3.2	4079	4199	2.9	55.7	55.9	0.2
66	0.69	0.65	-5.8	4078	4190	2.7	55.9	56.0	0.1
67	0.72	0.69	-3.6	4115	4277	3.9	56.3	55.5	-0.8
68	0.70	0.66	-6.4	4107	4266	3.9	56.0	55.8	-0.2
69	0.70	0.68	-1.9	4097	4296	4.9	55.8	56.0	0.2
70	0.69	0.65	-4.9	4089	4243	3.8	55.7	55.8	0.1
71	0.69	0.66	-4.7	4101	4316	5.2	55.6	55.5	-0.1
72	0.71	0.67	-5.4	4125	4271	3.5	55.5	55.6	0.1
73	0.67	0.67	0.0	4118	4237	2.9	55.6	55.6	0.0
74	0.68	0.64	-4.7	4126	4224	2.4	55.8	55.4	-0.4
75	0.66	0.65	-2.3	4156	4268	2.7	55.6	55.6	0.0
76	0.67	0.64	-3.3	4151	4170	0.5	55.7	55.4	-0.3
77	0.68	0.67	-0.9	4107	4259	3.7	55.8	55.8	0.0
78	0.72	0.68	-5.8	4164	4261	2.3	55.6	55.7	0.1
79	0.66	0.64	-1.7	4078	4174	2.4	55.5	55.4	-0.1
80	0.69	0.63	-9.0	4081	4295	5.2	55.6	55.6	0.0
81	0.66	0.65	-1.5	4139	4255	2.8	55.6	55.9	0.3
82	0.68	0.64	-6.9	4052	4227	4.3	55.7	55.6	-0.1
83	0.65	0.64	-2.2	4066	4227	4.0	55.7	55.6	-0.1
84	0.67	0.64	-4.5	4059	4193	3.3	55.9	55.5	-0.4
85	0.69	0.66	-3.3	4094	4279	4.5	55.8	55.8	0.0
86	0.73	0.70	-4.2	4152	4283	3.2	55.9	56.1	0.2
87	0.70	0.70	0.9	4095	4194	2.4	56.0	55.5	-0.5
88	0.71	0.68	-4.3	4114	4231	2.8	55.8	55.5	-0.3
89	0.66	0.62	-5.3	4062	4273	5.2	55.7	55.2	-0.5
90	0.70	0.67	-4.6	4156	4201	1.1	56.1	55.5	-0.6
91	0.65	0.63	-3.8	4063	4269	5.1	55.6	55.3	-0.3
92	0.67	0.63	-6.0	4137	4239	2.5	55.4	55.6	0.2

<b>QE File No.</b>	<b>Time-out for function test or others (hrs)</b>	<b>Issued Date</b>	<b>Reported By</b>	<b>Approved By</b>
DG20FNL013	2571.00	2020/8/26	Loly.Wang	Tim.Yi



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<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>				
1,759	2020/3/10 7:00 PM	2020/9/7 4:45 AM	100	0	<b>1466.0</b>				
Representative Test P/N : AFB1212HJ-00G14				<b>Current Test Status</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination		
Equipment: 1.Oven: E24-T0161									
<b>Test Data Between Initial Test and Final Test</b>									
Sample No.	Initial Test Current Spec. ( A ) <b>1.2 Max.</b>	Final Test Current Spec. ( A ) <b>1.2 Max.</b>	Deviation (%)	Initial Test Speed Spec. ( RPM ) <b>3870-4730</b>	Final Test Speed Spec. ( RPM ) <b>3870-4730</b>	Deviation (%)	Initial Test Noise Spec. ( dB A ) <b>59.0 Max</b>	Final Test Noise Spec. ( dB A ) <b>59.0 Max</b>	Deviation <b>3 dBMax.</b>
93	0.68	0.66	-3.7	4033	4293	6.4	55.9	55.4	-0.5
94	0.66	0.64	-4.2	4146	4213	1.6	56.0	55.7	-0.3
95	0.68	0.66	-2.9	4080	4208	3.1	55.8	55.6	-0.2
96	0.66	0.63	-4.8	4125	4201	1.8	55.8	55.4	-0.4
97	0.69	0.66	-3.5	4071	4231	3.9	55.9	55.7	-0.2
98	0.71	0.67	-5.9	4107	4213	2.6	55.9	55.6	-0.3
99	0.67	0.66	-0.9	4044	4200	3.9	56.0	55.9	-0.1
100	0.67	0.58	-14.3	4122	4534	10.0	55.7	56.2	0.5
X-Bar	0.68	0.65	-	4105.51	4241.95	-	55.86	55.61	-
$\sigma$	0.02	0.02	-	48.33	55.52	-	0.20	0.21	-
<b>QE File No.</b>	<b>Time-out for function test or others (hrs)</b>		<b>Issued Date</b>		<b>Reported By</b>		<b>Approved By</b>		
<b>DG20FNL013</b>	<b>2571.00</b>		<b>2020/8/26</b>		<b>Loly.Wang</b>		<b>Tim.Yi</b>		