



# DC FAN LIFE EXPERIMENT REPORT

Available for these models with lower speed and same physical structure. All model may be followed byRxx orFxx series suffixes. This test report applies to AFB 120x120x25.4mm series as the right table	AFB1212SHC9C				
	AFB1212EJ-01W3S				
	AFB1212EJ-01G44				
	AFB1212EJ-01G44 C				
<b>Representative Test P/N : AFB1212EJ-01BFL</b>					
<b>Equipment: 1.Oven: E24-T0161</b>					

◎ **L<sub>10</sub> Expectancy:** **70,000** hours minimum @ fan rated voltage and the temperature of 40°C  
 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<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)
<b>70</b>	<b>40</b>	<b>8.00</b>	<b>55</b>	<b>2.303</b>	<b>3,535</b>	<b>17,478.0</b>	<b>2,422,504</b>	<b>346,072</b>

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
<b>2016/5/13 5:00 PM</b>	<b>2017/1/31 9:46 PM</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	<b>17478.0</b>

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)
<b>25</b>	<b>22.63</b>	<b>6,851,876</b>	<b>978,839</b>
<b>30</b>	<b>16.00</b>	<b>4,845,008</b>	<b>692,144</b>
<b>40</b>	<b>8.00</b>	<b>2,422,504</b>	<b>346,072</b>
<b>50</b>	<b>4.00</b>	<b>1,211,252</b>	<b>173,036</b>
<b>60</b>	<b>2.00</b>	<b>605,626</b>	<b>86,518</b>
<b>70</b>	<b>1.00</b>	<b>302,813</b>	<b>43,259</b>

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  $> 3\text{dB}$  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
<b>DG16FNL056</b>	<b>9649.00</b>	<b>2019/6/18</b>	<b>Poppy.Liang</b>	<b>Tim.Yi</b>

BGN (dBA) : 16.0

Temp (°C) : 23.6



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				AFB1212EJ-01G44					
				AFB1212EJ-01G44 C					
<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>				
3,535	2016/5/13 5:00 PM	2017/1/31 9:46 PM	55	0	<b>17478.0</b>				
Representative Test P/N : AFB1212EJ-01BFL			<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>1.50 Max.</b>	Final Test Current Spec. ( A ) <b>1.50 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>60.0 Max</b>	Final Test Noise Spec. ( dB A ) <b>60.0 Max</b>	Deviation <b>3 dBMax.</b>
1	0.91	0.93	1.2	4291	4240	-1.2	55.0	55.0	0.0
2	0.93	0.90	-3.9	4309	4282	-0.6	54.8	56.3	1.5
3	0.92	0.93	1.0	4292	4313	0.5	53.5	55.4	1.9
4	0.92	0.91	-0.4	4253	4307	1.3	54.5	55.6	1.1
5	0.92	0.91	-1.6	4341	4245	-2.2	53.8	55.3	1.5
6	0.93	0.99	5.9	4273	4175	-2.3	53.9	56.1	2.2
7	0.90	0.95	5.2	4279	4270	-0.2	54.1	55.3	1.2
8	0.92	0.94	2.1	4277	4360	1.9	53.8	55.6	1.8
9	0.91	0.94	2.7	4296	4296	0.0	54.0	55.8	1.8
10	0.93	0.93	0.2	4278	4284	0.1	54.0	55.8	1.8
11	0.91	0.89	-2.0	4246	4317	1.7	53.6	55.6	2.0
12	0.91	0.91	-0.1	4265	4215	-1.2	54.3	55.6	1.3
13	0.92	0.95	3.5	4274	4075	-4.7	54.5	56.4	1.9
14	0.91	0.93	2.4	4322	4275	-1.1	55.5	56.0	0.5
15	0.91	0.91	0.4	4259	4282	0.5	54.6	55.3	0.7
16	0.89	0.91	1.3	4265	4255	-0.2	54.1	55.6	1.5
17	0.94	0.94	-0.3	4337	4377	0.9	53.4	55.7	2.3
18	0.95	0.91	-3.6	4301	4254	-1.1	54.3	55.8	1.5
19	0.89	0.91	1.9	4272	4272	0.0	53.9	56.0	2.1
20	0.94	0.91	-3.8	4319	4266	-1.2	56.1	55.2	-0.9
21	0.89	0.89	-0.3	4335	4313	-0.5	53.5	55.4	1.9
22	0.91	0.91	0.4	4294	4246	-1.1	54.5	55.6	1.1
23	0.91	0.97	6.8	4275	4043	-5.4	53.5	55.4	1.9
24	0.95	0.93	-1.6	4283	4268	-0.4	56.2	56.0	-0.2
25	0.94	0.92	-2.1	4372	4290	-1.9	55.2	56.4	1.2
26	0.94	0.94	-0.2	4389	4281	-2.5	54.7	55.7	1.0
27	0.94	0.99	5.2	4318	4140	-4.1	53.7	56.6	2.9
28	0.95	0.96	0.4	4352	4092	-6.0	54.1	55.6	1.5
29	0.90	0.92	1.7	4263	4263	0.0	55.1	55.5	0.4
30	0.90	0.92	2.4	4255	4236	-0.4	55.2	55.0	-0.2
31	0.93	0.94	1.1	4244	4361	2.8	54.1	55.0	0.9
32	0.96	0.90	-5.9	4340	4239	-2.3	56.0	56.0	0.0
<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>	
DG16FNL056	9649.00			2019/6/18		Poppy.Liang		Tim.Yi	



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	AFB1212EJ-01G44			
	AFB1212EJ-01G44 C			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,535	2016/5/13 5:00 PM	2017/1/31 9:46 PM	55	0	<b>17478.0</b>

Representative Test P/N : AFB1212EJ-01BFL	<b>Current Test Status</b>	<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-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
	<b>1.50 Max.</b>	<b>1.50 Max.</b>		<b>3870-4730</b>	<b>3870-4730</b>		<b>60.0 Max</b>	<b>60.0 Max</b>	
33	0.91	0.88	-3.7	4285	4218	-1.6	54.3	57.3	3.0
34	0.92	0.95	2.7	4288	4290	0.0	53.9	55.7	1.8
35	0.92	0.95	3.8	4286	4272	-0.3	56.3	56.1	-0.2
36	0.93	0.89	-4.5	4316	4325	0.2	54.5	55.6	1.1
37	0.91	0.93	2.1	4308	4277	-0.7	54.1	55.8	1.7
38	0.91	0.95	4.4	4282	4108	-4.1	54.4	55.3	0.9
39	0.94	0.94	-0.2	4281	4281	0.0	54.8	55.7	0.9
40	0.93	0.89	-3.8	4282	4112	-4.0	56.9	56.4	-0.5
41	0.93	1.00	7.8	4343	4101	-5.6	53.7	55.2	1.5
42	0.94	0.89	-6.1	4287	4255	-0.7	53.9	55.4	1.5
43	0.92	0.90	-1.7	4372	4288	-1.9	53.7	55.2	1.5
44	0.95	0.90	-5.4	4338	4324	-0.3	54.0	55.9	1.9
45	0.91	0.89	-1.5	4330	4250	-1.8	54.0	55.8	1.8
46	0.91	0.89	-2.2	4304	4281	-0.5	54.8	55.6	0.8
47	0.94	0.90	-3.5	4318	4233	-2.0	55.3	57.3	2.0
48	0.94	0.92	-2.1	4296	4243	-1.2	55.4	55.4	0.0
49	0.93	0.92	-0.3	4302	4204	-2.3	54.3	56.3	2.0
50	0.91	0.93	2.0	4327	4246	-1.9	53.7	55.8	2.1
51	0.92	0.92	0.4	4259	4321	1.5	53.6	55.1	1.5
52	0.94	0.90	-3.4	4328	4155	-4.0	56.0	55.6	-0.4
53	0.96	0.89	-6.9	4360	4220	-3.2	54.7	55.8	1.1
54	0.93	0.91	-3.0	4283	4174	-2.5	55.1	55.6	0.5
55	0.91	0.92	0.3	4320	4217	-2.4	54.0	55.8	1.8
X-Bar	0.92	0.92	-	4301.16	4245.95	-	54.49	55.73	-
$\sigma$	0.02	0.03	-	34.29	73.53	-	0.83	0.43	-

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