



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 70x70x15.0 mm series as the right table	AFB0712VHB-8L43			
	AFB0712HHB-AX14			
	AFB0712VHB-CF78			

Representative Test P/N : AFB0712VHB-AL3H

Equipment: 1.Oven: E24-F0109 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%).

Stress/Elevated Temperature T _s (°C) (Actual Test Temperature)	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	16,478.0	2,321,659	331,666

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2013/2/6 3:00 PM	2014/5/30 6:46 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	16478.0

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	22.63	6,566,642	938,092
30	16.00	4,643,317	663,331
40	8.00	2,321,659	331,666
50	4.00	1,160,829	165,833
60	2.00	580,415	82,916
70	1.00	290,207	41,458

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.

Test Result	<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG13FNL015	7986.00	2016/1/22	Loly.Wang	Tim.Yi

BGN (dBA) :15.9

Temp (°C) : 21.0



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)				
3,478	2013/2/6 3:00 PM	2014/5/30 6:46 AM	56	0	16478.0				
Representative Test P/N : AFB0712VHB-AL3H			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination			
Equipment: 1.Oven: E24-F0109				On/Off Cycles: Every 500 hours					
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (mA) 550 Max.	Final Test Current Spec. (mA) 550 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5888-6912	Final Test Speed Spec. (RPM) 5888-6912	Deviation (%)	Initial Test Noise Spec. (dB A) 51.0 Max	Final Test Noise Spec. (dB A) 51.0 Max	Deviation 3 dBMax.
1	506	464	-8.3	6300	6315	0.2	47.7	47.0	-0.7
2	498	483	-3.0	6247	5986	-4.2	47.2	47.9	0.7
3	451	471	4.4	6032	5978	-0.9	47.8	47.4	-0.4
4	475	467	-1.7	6120	6506	6.3	48.0	46.8	-1.2
5	457	483	5.7	6122	6564	7.2	47.6	46.5	-1.1
6	478	468	-2.1	6260	6280	0.3	47.3	46.7	-0.6
7	480	459	-4.4	6310	6435	2.0	47.8	47.6	-0.2
8	480	469	-2.3	6221	6145	-1.2	47.4	47.8	0.4
9	468	403	-13.9	6101	6256	2.5	47.1	46.6	-0.5
10	474	456	-3.8	6320	6254	-1.0	47.6	47.1	-0.5
11	484	481	-0.6	6235	6215	-0.3	47.5	46.8	-0.7
12	472	458	-3.0	6230	6392	2.6	47.9	47.3	-0.6
13	479	472	-1.5	6361	6279	-1.3	47.4	47.5	0.1
14	475	440	-7.4	6203	6409	3.3	47.8	47.7	-0.1
15	482	483	0.2	6207	6278	1.1	47.2	46.5	-0.7
16	474	481	1.5	6243	6248	0.1	47.6	47.9	0.3
17	470	490	4.3	6321	6369	0.8	47.4	46.7	-0.7
18	495	526	6.3	6265	6325	1.0	47.7	47.0	-0.7
19	460	469	2.0	6214	6400	3.0	47.9	47.2	-0.7
20	482	458	-5.0	6300	6254	-0.7	47.4	46.9	-0.5
21	494	456	-7.7	6341	6324	-0.3	47.4	47.4	0.0
22	482	471	-2.3	6227	6388	2.6	47.3	47.6	0.3
23	468	482	3.0	6168	6321	2.5	47.9	47.8	-0.1
24	482	459	-4.8	6126	6300	2.8	47.6	46.6	-1.0
25	490	458	-6.5	6265	6302	0.6	47.8	46.8	-1.0
26	492	464	-5.7	6196	6364	2.7	47.5	47.1	-0.4
27	483	486	0.6	6225	6307	1.3	47.7	47.3	-0.4
28	480	474	-1.3	6256	6389	2.1	47.3	46.9	-0.4
29	494	485	-1.8	6258	6560	4.8	47.6	46.6	-1.0
30	476	478	0.4	6196	6591	6.4	47.5	47.1	-0.4
31	479	477	-0.4	6282	6342	1.0	47.9	46.9	-1.0
32	462	480	3.9	6088	6284	3.2	47.2	47.2	0.0
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG13FNL015	7986.00		2016/1/22		Loly.Wang		Tim.Yi		



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Sample No.	Initial Test Current Spec. (mA) 550 Max.	Final Test Current Spec. (mA) 550 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5888-6912	Final Test Speed Spec. (RPM) 5888-6912	Deviation (%)	Initial Test Noise Spec. (dB A) 51.0 Max	Final Test Noise Spec. (dB A) 51.0 Max	Deviation 3 dBMax.
33	494	488	-1.2	6281	6389	1.7	47.7	47.5	-0.2
34	490	454	-7.3	6247	6560	5.0	47.5	47.3	-0.2
35	478	413	-13.6	6314	6289	-0.4	47.4	47.7	0.3
36	476	486	2.1	6168	6399	3.7	48.0	46.5	-1.5
37	462	480	3.9	6099	6354	4.2	47.5	47.0	-0.5
38	474	487	2.7	6256	6378	2.0	47.8	46.7	-1.1
39	470	467	-0.6	6255	6412	2.5	47.1	47.2	0.1
40	494	488	-1.2	6261	6445	2.9	47.6	46.9	-0.7
41	475	471	-0.8	6280	6388	1.7	47.5	47.4	-0.1
42	471	481	2.1	6477	6325	-2.3	47.7	47.6	-0.1
43	475	491	3.4	6210	6387	2.9	47.2	47.8	0.6
44	474	475	0.2	6339	6398	0.9	47.6	46.6	-1.0
45	475	479	0.8	6176	6458	4.6	47.9	46.8	-1.1
46	490	486	-0.8	6282	6258	-0.4	47.4	47.1	-0.3
47	470	467	-0.6	6071	6278	3.4	47.6	47.3	-0.3
48	481	483	0.4	6232	6248	0.3	47.2	47.5	0.3
49	425	456	7.3	6025	6412	6.4	47.9	47.7	-0.2
50	475	526	10.7	6261	6400	2.2	47.5	46.5	-1.0
51	466	436	-6.4	6228	6402	2.8	47.7	47.9	0.2
52	491	425	-13.4	6234	6512	4.5	47.3	46.7	-0.6
53	483	421	-12.8	6189	6328	2.2	47.8	47.0	-0.8
54	478	482	0.8	6221	6388	2.7	47.5	47.2	-0.3
55	474	480	1.3	6177	6284	1.7	47.6	47.4	-0.2
56	474	486	2.5	6177	6389	3.4	47.9	47.6	-0.3
X-Bar	477.4	470.7	-	6226.8	6347.2	-	47.57	47.2	-
σ	12.823	22.150	-	82.918	115.891	-	0.242	0.425	-
QE File No.	Time-out for function test or others (hrs)			Issued Date		Reported By		Approved By	
DG13FNL015	7986.00			2016/1/22		Loly.Wang		Tim.Yi	