



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 EFB 50x50x10.0 mm series as the right table	EFB0512HA12H			
	EFB0512HA-TP02			
	EFB0512HA-TP42			
	EFB0512HHAX01			

Representative Test P/N : EFB0512HHA-F00	Date Code: 3708PR
Equipment: 1.Oven: E24-F0030	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 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)
70	40	8.00	56	2.303	3,478	12,478.0	1,758,081	251,154

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2013/7/15 2:00 PM	2015/1/11 3:46 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	12478.0

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	4,972,603	710,372
30	16.00	3,516,162	502,309
40	8.00	1,758,081	251,154
50	4.00	879,040	125,577
60	2.00	439,520	62,789
70	1.00	219,760	31,394

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
DG13FNL097	9604.00	2016/2/23	Loly.Wang	Tim.Yi

BGN (dBA) : 16.2

Temp (°C) : 23.4



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				EFB0512HA-TP02					
				EFB0512HA-TP42					
				EFB0512HHAX01					
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)				
3,478	2013/7/15 2:00 PM	2015/1/11 3:46 PM	56	0	12478.0				
Representative Test P/N : EFB0512HHA-F00			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination			
Equipment: 1.Oven: E24-F0030				On/Off Cycles: Every 500 hours					
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (A) 0.20 Max.	Final Test Current Spec. (A) 0.20 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5980-7020	Final Test Speed Spec. (RPM) 5980-7020	Deviation (%)	Initial Test Noise Spec. (dB A) 38.5 Max	Final Test Noise Spec. (dB A) 38.5 Max	Deviation 3 dBMax.
1	0.154	0.153	-0.6	6378	6754	5.9	35.4	36.7	1.3
2	0.160	0.151	-5.6	6282	6729	7.1	36.1	37.1	1.0
3	0.155	0.155	0.0	6419	6700	4.4	35.9	36.0	0.1
4	0.160	0.155	-3.1	6393	6754	5.6	35.4	37.1	1.7
5	0.157	0.153	-2.5	6314	6772	7.3	36.2	36.9	0.7
6	0.162	0.154	-4.9	6243	6734	7.9	35.3	36.5	1.2
7	0.157	0.153	-2.5	6353	6701	5.5	35.5	36.8	1.3
8	0.158	0.156	-1.3	6440	6636	3.0	36.0	36.1	0.1
9	0.157	0.154	-1.9	6389	6796	6.4	35.4	36.3	0.9
10	0.161	0.156	-3.1	6306	6722	6.6	35.5	36.5	1.0
11	0.158	0.155	-1.9	6312	6725	6.5	35.9	36.7	0.8
12	0.161	0.154	-4.3	6281	6767	7.7	35.7	36.9	1.2
13	0.156	0.153	-1.9	6440	6801	5.6	35.6	37.1	1.5
14	0.161	0.154	-4.3	6286	6788	8.0	36.1	36.0	-0.1
15	0.157	0.152	-3.2	6316	6852	8.5	35.9	36.2	0.3
16	0.159	0.153	-3.8	6353	6806	7.1	35.3	36.4	1.1
17	0.157	0.155	-1.3	6259	6766	8.1	36.1	36.6	0.5
18	0.160	0.154	-3.8	6221	6701	7.7	35.5	36.8	1.3
19	0.156	0.153	-1.9	6300	6700	6.3	35.4	37.0	1.6
20	0.160	0.155	-3.1	6358	6815	7.2	35.5	36.3	0.8
21	0.156	0.154	-1.3	6327	6705	6.0	35.7	36.1	0.4
22	0.158	0.155	-1.9	6405	6675	4.2	35.3	36.5	1.2
23	0.158	0.154	-2.5	6322	6835	8.1	35.8	36.7	0.9
24	0.159	0.153	-3.8	6420	6818	6.2	36.0	36.9	0.9
25	0.157	0.154	-1.9	6323	6812	7.7	36.2	37.1	0.9
26	0.160	0.153	-4.4	6283	6767	7.7	35.7	36.4	0.7
27	0.157	0.153	-2.5	6290	6843	8.8	35.9	36.6	0.7
28	0.158	0.154	-2.5	6398	6733	5.2	35.5	36.8	1.3
29	0.155	0.153	-1.3	6461	6781	5.0	35.6	36.2	0.6
30	0.159	0.153	-3.8	6385	6804	6.6	35.7	36.4	0.7
31	0.157	0.152	-3.2	6290	6787	7.9	36.0	37.0	1.0
32	0.159	0.155	-2.5	6421	6710	4.5	35.7	36.1	0.4
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG13FNL097	9604.00		2016/2/23		Loly.Wang		Tim.Yi		



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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EFB0512HA12H				
EFB0512HA-TP02				
EFB0512HA-TP42				
EFB0512HHAX01				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2013/7/15 2:00 PM	2015/1/11 3:46 PM	56	0	12478.0

Representative Test P/N : EFB0512HHA-F00	Current Test Status	<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-F0030 On/Off Cycles: Every 500 hours

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 0.20 Max.	Final Test Current Spec. (A) 0.20 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5980-7020	Final Test Speed Spec. (RPM) 5980-7020	Deviation (%)	Initial Test Noise Spec. (dB A) 38.5 Max	Final Test Noise Spec. (dB A) 38.5 Max	Deviation 3 dBMax.
33	0.157	0.154	-1.9	6257	6689	6.9	36.0	36.3	0.3
34	0.160	0.155	-3.1	6401	6648	3.9	35.7	36.6	0.9
35	0.158	0.153	-3.2	6288	6738	7.2	35.6	36.0	0.4
36	0.159	0.153	-3.8	6305	6700	6.3	36.1	36.2	0.1
37	0.155	0.153	-1.3	6447	6801	5.5	35.3	36.4	1.1
38	0.160	0.155	-3.1	6302	6741	7.0	35.7	36.6	0.9
39	0.158	0.155	-1.9	6273	6767	7.9	36.0	36.8	0.8
40	0.159	0.155	-2.5	6343	6669	5.1	35.8	37.0	1.2
41	0.157	0.155	-1.3	6306	6712	6.4	35.5	36.1	0.6
42	0.160	0.154	-3.8	6326	6810	7.7	35.4	36.3	0.9
43	0.157	0.152	-3.2	6312	6842	8.4	35.7	36.5	0.8
44	0.159	0.153	-3.8	6308	6707	6.3	35.5	36.7	1.2
45	0.158	0.154	-2.5	6283	6810	8.4	35.3	36.9	1.6
46	0.159	0.154	-3.1	6399	6757	5.6	35.6	37.1	1.5
47	0.154	0.152	-1.3	6558	6800	3.7	35.7	36.2	0.5
48	0.160	0.152	-5.0	6308	6842	8.5	35.6	36.0	0.4
49	0.158	0.154	-2.5	6297	6772	7.5	35.5	36.6	1.1
50	0.160	0.153	-4.4	6312	6789	7.6	35.4	36.4	1.0
51	0.157	0.153	-2.5	6288	6740	7.2	35.6	36.8	1.2
52	0.159	0.153	-3.8	6404	6889	7.6	35.9	37.0	1.1
53	0.156	0.154	-1.3	6186	6785	9.7	35.8	36.3	0.5
54	0.160	0.155	-3.1	6370	6730	5.7	36.3	36.5	0.2
55	0.155	0.154	-0.6	6382	6681	4.7	36.1	36.7	0.6
56	0.159	0.155	-2.5	6347	6688	5.4	35.7	36.9	1.2
X-Bar	0.16	0.15	-	6338.8	6757.07	-	35.71	36.57	-
σ	0.002	0.001	-	67.505	56.316	-	0.272	0.339	-

QE File No.	Time-out for function test or others (hrs)	Issued Date	Reported By	Approved By
DG13FNL097	9604.00	2016/2/23	Loly.Wang	Tim.Yi