



DC FAN CUSTOMIZED 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 40x40x20.0 mm series as the right table	EFB0412VHD-SP05				

Representative Test P/N : EFB0412VHD-6H36	
Equipment: 1.Oven: E24-T0171	

⊙ **L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C**
 According to the equation for **Weibull distribution**, **MTTF ≅ 1.89×L10 = 132,300 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,

$$t = 1.119 \times \text{MTTF} \times [(B_{r,c}) \div n]^{0.33} \div A_F, \text{ and } A_F = 1.5^{(T_s - T_u)/10}$$

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 MTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
70	40	3.38	56	2.303	15,303	3,478.0	30,069	15,909

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2006/9/30 5:00 PM	2008/8/20 3:48 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	3478.0

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 MTF Estimation (°C)	Acceleration Factor A _F	Estimated MTF (hours)	Estimated L ₁₀ (hours)
25	6.20	55,240	29,228
30	5.06	45,103	23,864
40	3.38	30,069	15,909
50	2.25	20,046	10,606
60	1.50	13,364	7,071
70	1.00	8,909	4,714

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 Method according to IPC-9591.

Test Result	<input checked="" type="checkbox"/> Accept
	<input type="checkbox"/> Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL205	1256.00	2007/4/15	NaNa.Wang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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 40x40x20.0 mm series as the right table	EFB0412VHD-SP05				
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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)
15,303	2006/9/30 5:00 PM	2008/8/20 3:48 PM	56	0	3478.0

Representative Test P/N : EFB0412VHD-6H36	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-T0171

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec.	Final Test Current Spec.	Deviation (%)	Initial Test Speed Spec.	Final Test Speed Spec.	Deviation (%)	Initial Test Noise Spec.	Final Test Noise Check.	Deviation
	(A) 180Max.	(A) 180Max.		(RPM) 8100-9900	(RPM) 8100-9900		(dB A) 38.5Max	(dB A) 38.5Max	
1	129	102	-20.9	8789	9237	5.1	34.5	35.2	0.7
2	124	97	-21.8	8969	9286	3.5	34.5	35.1	0.6
3	126	102	-19.0	8749	9217	5.3	34.2	35.5	1.3
4	130	104	-20.0	8762	9261	5.7	34.8	35.3	0.5
5	124	98	-21.0	8760	9301	6.2	34.4	35.4	1.0
6	125	105	-16.0	8923	9239	3.5	34.6	35.0	0.4
7	125	99	-20.8	8909	9432	5.9	34.1	35.1	1.0
8	128	98	-23.4	8809	9345	6.1	34.4	35.2	0.8
9	127	97	-23.6	8907	9331	4.8	34.7	35.3	0.6
10	125	101	-19.2	8610	9179	6.6	34.5	35.3	0.8
11	127	104	-18.1	8679	9236	6.4	34.8	35.5	0.7
12	121	99	-18.2	8927	9343	4.7	34.2	35.0	0.8
13	124	105	-15.3	8844	9241	4.5	34.6	35.0	0.4
14	127	101	-20.5	9147	9223	0.8	34.2	35.4	1.2
15	130	95	-26.9	8831	9379	6.2	34.5	35.3	0.8
16	122	101	-17.2	8637	9409	8.9	34.1	35.4	1.3
17	126	98	-22.2	8750	9296	6.2	34.7	35.6	0.9
18	133	104	-21.8	8791	9216	4.8	34.4	35.7	1.3
19	122	102	-16.4	8766	9193	4.9	34.6	35.4	0.8
20	128	104	-18.8	8791	9166	4.3	35.0	35.6	0.6
21	127	96	-24.4	8863	9361	5.6	34.4	34.9	0.5
22	128	100	-21.9	8540	9248	8.3	34.7	35.0	0.3
23	123	104	-15.4	8651	9251	6.9	34.5	35.1	0.6
24	125	103	-17.6	8741	9169	4.9	34.8	35.3	0.5
25	122	101	-17.2	8981	9233	2.8	34.3	35.2	0.9
26	125	101	-19.2	8849	9425	6.5	34.7	35.6	0.9
27	127	98	-22.8	8923	9403	5.4	34.5	35.4	0.9
28	124	98	-21.0	8661	9199	6.2	34.8	35.2	0.4
29	127	102	-19.7	9008	9245	2.6	34.7	35.3	0.6
30	141	102	-27.7	8842	9244	4.5	34.3	35.4	1.1
31	123	96	-22.0	8936	9304	4.1	34.5	35.6	1.1
32	125	96	-23.2	8777	9224	5.1	34.2	35.2	1.0
33	125	102	-18.4	8811	9200	4.4	34.7	35.3	0.6
34	128	98	-23.4	9004	9313	3.4	34.4	35.4	1.0
35	124	99	-20.2	8927	9335	4.6	34.6	35.6	1.0

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL205	1256.00	2007/4/15	NaNa.Wang	Tim.Yi



DC FAN FUNCTION TEST RECORD

FOR CUSTOMIZED 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)
15,303	2006/9/30 5:00 PM	2008/8/20 3:48 PM	56	0	3478.0

Representative Test P/N : EFB0412VHD-6H36	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-T0171

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec.	Final Test Current Spec.	Deviation (%)	Initial Test Speed Spec.	Final Test Speed Spec.	Deviation (%)	Initial Test Noise Spec.	Final Test Noise Check.	Deviation
	(A) 180Max.	(A) 180Max.		(RPM) 8100-9900	(RPM) 8100-9900		(dB A) 38.5Max	(dB A) 38.5Max	
36	127	106	-16.5	8883	9209	3.7	34.1	35.7	1.6
37	129	96	-25.6	8734	9320	6.7	34.5	35.2	0.7
38	120	99	-17.5	8652	9365	8.2	34.3	35.3	1.0
39	120	97	-19.2	8868	9404	6.0	34.6	35.4	0.8
40	124	99	-20.2	8804	9363	6.3	34.3	35.6	1.3
41	124	108	-12.9	8818	9198	4.3	34.2	35.8	1.6
42	127	100	-21.3	8772	9245	5.4	34.7	35.2	0.5
43	127	102	-19.7	8759	9211	5.2	34.4	35.3	0.9
44	126	102	-19.0	8708	9194	5.6	34.8	35.5	0.7
45	123	100	-18.7	8788	9316	6.0	34.5	35.4	0.9
46	125	99	-20.8	8826	9371	6.2	34.2	35.2	1.0
47	123	103	-16.3	8856	9146	3.3	34.6	35.6	1.0
48	127	97	-23.6	8648	9337	8.0	34.3	35.8	1.5
49	123	99	-19.5	8875	9322	5.0	34.7	35.4	0.7
50	128	98	-23.4	8944	9433	5.5	34.5	35.3	0.8
51	130	105	-19.2	9086	9198	1.2	34.1	35.4	1.3
52	123	97	-21.1	8817	9323	5.7	34.9	35.6	0.7
53	128	103	-19.5	8826	9382	6.3	34.5	35.2	0.7
54	127	99	-22.0	8969	9461	5.5	34.2	35.7	1.5
55	124	105	-15.3	9147	9166	0.2	34.6	35.3	0.7
56	128	99	-22.7	8830	9520	7.8	34.1	35.4	1.3
X-Bar	125.893	100.446	-	8829.893	9288.714	-	34.482	35.360	-
σ	3.350	3.027	-	125.573	87.718	-	0.230	0.213	-

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DG06FNL205	1256.00	2007/4/15	NaNa.Wang	Tim.Yi