



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 BFB50x50x10 mm series as the right table	BFB0512LA-8W29		BFB0512HHA-C	BFB0512HA-C	BFB0512MA-C
	BFB0512LA-C	BFB0505HHA-C	BFB0505HA-C	BFB0505MA-C	BFB0505LA-C

Representative Test P/N : BFB0512HHA-C

Equipment: 1.Oven: E24-F0030 **On/Off Cycles: Every 500 hours**

⊙ **L₁₀ Expectancy: 30,000 hours minimum @ fan rated voltage and the temperature of 40 °C**

According to the equation for **Weibull distribution**, **MTTF ≐ 7×L10 = 210,000 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	1,490	11,490.0	1,618,877	231,268

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2007/1/10 12:00 PM	2007/10/29 5:28 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	11490.0

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	4,578,876	654,125
30	16.00	3,237,754	462,536
40	8.00	1,618,877	231,268
50	4.00	809,439	115,634
60	2.00	404,719	57,817
70	1.00	202,360	28,909

- 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
DG06FNL258	5511.00	2008/12/23	Nan Yang	Zenny Lei



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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BFB0512LA-8W29	BFB0512HHA-C	BFB0512HA-C	BFB0512MA-C
BFB0512LA-C	BFB0505HHA-C	BFB0505HA-C	BFB0505MA-C

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,490	2007/1/10 12:00 PM	2007/10/29 5:28 AM	56	0	11490.0

Representative Test P/N : BFB0512HHA-C	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	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation
	Current Spec. (mA)	Current Spec. (mA)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	240Max.	240Max.		5015-6490	5015-6490		42.5Max	42.5Max	3 dBMax.
1	132	129	-2.3	5628	6143	9.2	37.8	38.1	0.3
2	131	119	-9.2	5826	6102	4.7	37.5	38.5	1.0
3	133	128	-3.8	5694	6154	8.1	37.7	38.9	1.2
4	130	118	-9.2	5627	6072	7.9	37.3	38.4	1.1
5	135	128	-5.2	5674	6064	6.9	37.2	38.7	1.5
6	131	127	-3.1	5662	6123	8.1	37.7	38.2	0.5
7	135	127	-5.9	5714	6083	6.5	37.3	38.9	1.6
8	136	127	-6.6	5707	6076	6.5	37.6	38.3	0.7
9	137	126	-8.0	5588	6111	9.4	37.6	38.5	0.9
10	135	127	-5.9	5727	6069	6.0	37.8	38.8	1.0
11	136	126	-7.4	5678	6079	7.1	37.4	38.6	1.2
12	133	123	-7.5	5845	6044	3.4	37.7	38.2	0.5
13	136	126	-7.4	5632	6088	8.1	37.5	38.1	0.6
14	136	127	-6.6	5654	6081	7.6	37.6	38.4	0.8
15	138	126	-8.7	5650	6089	7.8	37.3	38.7	1.4
16	134	128	-4.5	5761	6037	4.8	37.6	38.5	0.9
17	137	127	-7.3	5710	6080	6.5	37.7	38.9	1.2
18	135	126	-6.7	5726	6077	6.1	37.4	38.4	1.0
19	137	126	-8.0	5747	6073	5.7	37.8	38.8	1.0
20	136	127	-6.6	5737	6103	6.4	37.5	38.6	1.1
21	136	126	-7.4	5715	6084	6.5	37.7	38.3	0.6
22	135	126	-6.7	5757	6084	5.7	37.6	38.7	1.1
23	135	117	-13.3	5746	6031	5.0	37.2	38.2	1.0
24	134	125	-6.7	5720	6071	6.1	37.5	38.6	1.1
25	132	125	-5.3	5595	6077	8.6	37.8	38.9	1.1
26	135	117	-13.3	5676	6100	7.5	37.7	38.4	0.7
27	137	118	-13.9	5638	6052	7.3	37.6	38.8	1.2
28	136	125	-8.1	5747	6078	5.8	37.6	38.5	0.9
29	141	128	-9.2	5674	6062	6.8	37.5	38.2	0.7
30	139	126	-9.4	5634	6069	7.7	37.7	38.5	0.8
31	139	137	-1.4	5712	6065	6.2	37.4	38.3	0.9
32	137	127	-7.3	5820	6065	4.2	37.7	38.7	1.0
33	138	128	-7.2	5779	6059	4.8	37.7	38.4	0.7
34	136	127	-6.6	5738	6106	6.4	37.6	38.6	1.0
35	136	120	-11.8	5629	6097	8.3	37.3	38.7	1.4

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL258	5511.00	2008/12/23	Nan Yang	Zenny Lei



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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BFB0512LA-8W29	BFB0512HHA-C	BFB0512HA-C	BFB0512MA-C
BFB0512LA-C	BFB0505HHA-C	BFB0505HA-C	BFB0505MA-C

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,490	2007/1/10 12:00 PM	2007/10/29 5:28 AM	56	0	11490.0

Representative Test P/N : BFB0512HHA-C	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	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation
	Current Spec.	Current Spec.		Speed Spec.	Speed Spec.		Noise Spec.	Noise Spec.	
	(mA) 240Max.	(mA) 240Max.		(RPM) 5015-6490	(RPM) 5015-6490		(dB A) 42.5Max	(dB A) 42.5Max	
36	137	128	-6.6	5789	6117	5.7	37.8	38.4	0.6
37	134	126	-6.0	5705	6092	6.8	37.5	38.5	1.0
38	137	129	-5.8	5777	6077	5.2	37.7	38.3	0.6
39	137	126	-8.0	5612	6099	8.7	37.4	38.2	0.8
40	137	120	-12.4	5719	6048	5.8	37.6	38.5	0.9
41	133	129	-3.0	5880	6083	3.5	37.6	38.1	0.5
42	136	126	-7.4	5729	6100	6.5	37.5	38.7	1.2
43	137	129	-5.8	5756	6050	5.1	37.7	38.4	0.7
44	139	126	-9.4	5711	6082	6.5	37.6	38.9	1.3
45	139	129	-7.2	5661	6053	6.9	37.7	38.5	0.8
46	138	125	-9.4	5785	6070	4.9	37.8	38.1	0.3
47	136	129	-5.1	5786	6050	4.6	37.5	38.6	1.1
48	137	125	-8.8	5735	6077	6.0	37.2	38.2	1.0
49	136	126	-7.4	5803	6099	5.1	37.7	38.4	0.7
50	137	120	-12.4	5724	6063	5.9	37.4	38.3	0.9
51	137	120	-12.4	5680	6026	6.1	37.6	38.6	1.0
52	136	126	-7.4	5802	6099	5.1	37.7	38.2	0.5
53	138	120	-13.0	5702	6047	6.1	37.8	38.4	0.6
54	135	126	-6.7	5614	6074	8.2	37.5	38.1	0.6
55	135	121	-10.4	5682	6055	6.6	37.6	38.5	0.9
56	136	126	-7.4	5825	6081	4.4	37.4	38.7	1.3
X-Bar	135.8	125.4	-	5715.1	6078.4	-	37.57	38.48	-
σ	2.150	3.681	-	66.783	25.077	-	0.167	0.238	-

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DG06FNL258	5511.00	2008/12/23	Nan Yang	Zenny Lei