



DC FAN CUSTOMIZED LIFE EXPERIMENT TEST 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 FFB120x120x38 mm series as the right table	FFB1248XHE-MF00			
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Representative Test P/N :FFB1224XHE-MF00	
Equipment: 1.Oven: E24-T0165	On/Off Cycles: Every 500 hours

◎ **L₁₀ Expectancy: 80,000 hours minimum @ fan rated voltage and the temperature of 40 °C**
 According to the equation for **Weibull distribution**, **MTTF ≐ 7×L10 = 560,000 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	3,975	25,360.0	3,573,083	510,440

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2005/5/25 11:00 PM	2008/1/7 7:06 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	25360.0

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	10,106,205	1,443,744
30	16.00	7,146,166	1,020,881
40	8.00	3,573,083	510,440
50	4.00	1,786,541	255,220
60	2.00	893,271	127,610
70	1.00	446,635	63,805

Fan permission criteria for the measurement after test :
 1. For current, the limit is less than spec.(max.).
 2. For speed, the allowable decrease is less than 15%.
 3. For noise, the limit is less than spec.(max.). + 3 dB

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
DG05FNL111	18977.50	2010/6/16 8:30 AM	Nan Yang	Zenny Lei



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FFB1248XHE-MF00

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,975	2005/5/25 11:00 PM	2008/1/7 7:06 AM	56	0	25360.0

Representative Test P/N :FFB1224XHE-MF00	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-T0165 On/Off Cycles: Every 500 hours

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 3.90Max.	Final Test Current Spec. (A) 3.90Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5670-6930	Final Test Speed Spec. (RPM) 5670-6930	Deviation (%)	Initial Test Noise Spec. (dB A) 77.5Max	Final Test Noise Spec. (dB A) 77.5Max	Deviation (%)
1	3.06	3.27	6.7	6079	6338	4.3	73.8	74.6	1.1
2	3.06	3.11	1.6	6894	6243	-9.4	74.4	74.2	-0.3
3	3.02	3.34	10.7	6383	6367	-0.3	74.3	74.5	0.3
4	3.30	3.11	-5.8	6276	6261	-0.2	73.9	74.3	0.5
5	3.20	3.28	2.4	6251	6243	-0.1	74.3	74.6	0.4
6	3.36	3.39	0.8	6300	6399	1.6	74.2	74.4	0.3
7	3.50	3.24	-7.4	6374	6275	-1.6	74.0	74.6	0.8
8	3.31	3.35	1.1	6282	6348	1.1	74.2	74.3	0.1
9	3.38	3.29	-2.6	6294	6060	-3.7	74.1	74.4	0.4
10	3.23	3.26	0.9	6296	6274	-0.3	74.1	74.5	0.5
11	3.16	3.41	7.8	6175	6440	4.3	74.0	74.8	1.1
12	3.02	3.17	5.0	6152	6245	1.5	74.0	74.2	0.3
13	3.04	3.34	9.9	6369	6357	-0.2	74.2	74.7	0.7
14	3.12	3.41	9.3	6302	6461	2.5	74.1	74.3	0.3
15	3.44	3.22	-6.5	6390	6266	-1.9	74.4	74.6	0.3
16	3.34	3.05	-8.8	6332	6229	-1.6	74.0	74.4	0.5
17	3.41	3.31	-2.9	6315	6340	0.4	73.9	74.7	1.1
18	3.05	3.11	2.1	6477	6183	-4.5	74.2	74.5	0.4
19	3.20	3.38	5.3	6214	6355	2.3	73.8	74.8	1.4
20	3.25	3.29	1.4	6224	6327	1.7	73.8	74.6	1.1
21	3.11	3.30	6.2	6302	6386	1.3	74.3	74.3	0.0
22	3.21	3.41	6.3	6250	6375	2.0	73.8	74.5	0.9
23	3.24	3.21	-0.9	6200	6244	0.7	73.7	74.7	1.4
24	3.30	3.18	-3.8	6253	6290	0.6	74.4	74.4	0.0
25	3.25	3.28	0.8	6241	6273	0.5	73.8	74.6	1.1
26	3.42	2.97	-13.1	6282	6123	-2.5	73.8	74.3	0.7
27	3.07	3.27	6.4	6242	6317	1.2	73.9	74.8	1.2
28	3.18	3.26	2.6	6263	6242	-0.3	74.3	74.5	0.3
29	3.17	3.38	6.7	6203	6422	3.5	74.3	74.7	0.5
30	3.28	2.84	-13.5	6214	5993	-3.6	74.0	74.2	0.3
31	3.26	3.19	-2.2	6268	6192	-1.2	73.9	74.5	0.8
32	3.40	3.22	-5.3	6327	6258	-1.1	74.2	74.3	0.1
33	3.02	3.29	9.1	6300	6288	-0.2	74.2	74.6	0.5
34	3.31	3.03	-8.5	6296	6165	-2.1	74.0	74.4	0.5
35	3.22	3.39	5.4	6222	6307	1.4	74.4	74.8	0.5

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36	3.25	3.42	5.5	6253	6385	2.1	74.1	74.2	0.1
37	3.30	3.45	4.6	6312	6398	1.4	74.3	74.5	0.3
38	2.93	3.24	10.5	6038	6305	4.4	74.2	74.3	0.1
39	3.41	3.30	-3.4	6365	6325	-0.6	74.0	74.7	0.9
40	3.35	3.24	-3.5	6262	6313	0.8	74.3	74.5	0.3
41	3.32	3.23	-2.8	6298	6252	-0.7	74.3	74.8	0.7
42	3.20	3.24	1.3	6203	6278	1.2	74.2	74.2	0.0
43	3.22	3.17	-1.6	6295	6229	-1.0	73.9	74.7	1.1
44	3.29	3.21	-2.7	6247	6245	0.0	74.3	74.6	0.4
45	3.45	3.25	-5.8	6322	6252	-1.1	74.2	74.2	0.0
46	3.31	3.16	-4.3	6286	6266	-0.3	73.8	74.4	0.8
47	3.34	3.25	-2.6	6346	6286	-0.9	74.0	74.6	0.8
48	3.46	3.21	-7.2	6372	6263	-1.7	74.1	74.7	0.8
49	3.09	3.36	8.7	6110	6320	3.4	74.0	74.3	0.4
50	3.04	3.19	4.9	6353	6250	-1.6	73.9	74.5	0.8
51	2.97	3.34	12.3	5890	6320	7.3	74.1	74.7	0.8
52	3.39	3.21	-5.2	6315	6274	-0.6	74.2	71.0	-4.3
53	3.31	3.01	-9.3	6298	5918	-6.0	74.1	74.8	0.9
54	3.42	3.26	-4.8	6389	6330	-0.9	73.8	74.5	0.9
55	3.58	3.36	-6.1	6453	6425	-0.4	73.9	74.3	0.5
56	3.30	3.42	3.8	6298	6385	1.4	74.2	74.7	0.7
X-Bar	3.247	3.251	-	6284.8	6284.0	-	74.08	74.44	-
σ	0.147	0.122	-	126.773	99.801	-	0.194	0.505	-

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