



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 THB 120x120x25.4 mm series as the right table	THB1248B-AXFC			
	THB1248B-AAQ3			
	THB1248B-A			
Representative Test P/N : THB1248B-AXXX				Date Code: 3606PR
Equipment: 1.Oven: E24-F0107			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	8,478.0	1,194,503	170,643

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status		Current Total Test Time (hours)
2013/7/4 8:00 AM	2014/3/25 1:04 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination	8478.0

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	3,378,565	482,652
30	16.00	2,389,006	341,287
40	8.00	1,194,503	170,643
50	4.00	597,252	85,322
60	2.00	298,626	42,661
70	1.00	149,313	21,330

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
DG13FNL085	2863.30	2014/11/17	NaNa.Wang	Tim. Yi

BGN (dBA) : 16.3

Temp (°C) : 22.6



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				THB1248B-AAQ3					
				THB1248B-A					
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)				
3,478	2013/7/4 8:00 AM	2014/3/25 1:04 PM	56	0	8478.0				
Representative Test P/N : THB1248B-AXXX			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination			
Equipment: 1.Oven: E24-F0107				On/Off Cycles: Every 500 hours					
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (A)	Final Test Current Spec. (A)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Spec. (dB A)	Deviation 3 dBMax.
	0.39 Max.	0.39 Max.		4140-4860	4140-4860		59.5 Max	59.5 Max	
1	0.28	0.25	-9.1	4612	4368	-5.3	55.1	53.8	-1.3
2	0.27	0.26	-3.7	4609	4320	-6.3	55.5	53.9	-1.6
3	0.29	0.28	-4.4	4580	4287	-6.4	55.9	54.0	-1.9
4	0.29	0.27	-6.9	4773	4324	-9.4	55.0	54.4	-0.6
5	0.27	0.28	4.5	4601	4334	-5.8	55.4	54.0	-1.4
6	0.29	0.27	-6.9	4645	4363	-6.1	55.7	54.2	-1.5
7	0.27	0.26	-4.8	4568	4325	-5.3	55.2	54.8	-0.4
8	0.29	0.26	-10.3	4556	4330	-5.0	54.8	53.9	-0.9
9	0.28	0.25	-10.1	4602	4409	-4.2	55.5	54.1	-1.4
10	0.26	0.25	-3.8	4550	4379	-3.8	55.0	54.3	-0.7
11	0.27	0.22	-19.7	4563	4308	-5.6	55.2	54.5	-0.7
12	0.27	0.25	-8.1	4587	4301	-6.2	55.5	54.7	-0.8
13	0.26	0.28	7.7	4625	4336	-6.2	55.8	53.8	-2.0
14	0.29	0.28	-3.4	4577	4457	-2.6	55.1	54.0	-1.1
15	0.29	0.25	-13.8	4637	4422	-4.6	55.4	54.2	-1.2
16	0.27	0.29	7.4	4595	4329	-5.8	55.7	54.4	-1.3
17	0.28	0.27	-1.8	4560	4376	-4.0	55.0	54.6	-0.4
18	0.26	0.28	7.7	4556	4336	-4.8	55.5	54.8	-0.7
19	0.26	0.29	11.5	4588	4332	-5.6	54.9	53.9	-1.0
20	0.27	0.29	7.4	4613	4365	-5.4	55.2	54.1	-1.1
21	0.28	0.24	-14.0	4584	4398	-4.1	55.7	54.3	-1.4
22	0.27	0.29	5.8	4607	4277	-7.2	55.1	54.5	-0.6
23	0.27	0.25	-7.4	4586	4318	-5.8	55.2	54.7	-0.5
24	0.28	0.27	-3.2	4578	4412	-3.6	55.6	53.8	-1.8
25	0.28	0.29	3.6	4557	4304	-5.6	55.3	54.0	-1.3
26	0.28	0.26	-7.5	4663	4325	-7.2	55.0	54.2	-0.8
27	0.27	0.27	0.0	4572	4389	-4.0	55.6	54.4	-1.2
28	0.28	0.26	-6.1	4609	4365	-5.3	55.2	54.6	-0.6
29	0.29	0.25	-13.8	4553	4355	-4.3	55.3	54.1	-1.2
30	0.28	0.25	-10.7	4595	4450	-3.2	55.0	54.3	-0.7
31	0.28	0.24	-12.7	4610	4400	-4.6	55.5	54.5	-1.0
32	0.26	0.27	2.3	4600	4312	-6.3	55.1	54.7	-0.4
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG13FNL085	2863.30		2014/11/17		NaNa.Wang		Tim.Yi		



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	2013/7/4 8:00 AM	2014/3/25 1:04 PM	56	0	8478.0

Representative Test P/N : THB1248B-AXXX	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-F0107	On/Off Cycles: Every 500 hours
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Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 0.39 Max.	Final Test Current Spec. (A) 0.39 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 4140-4860	Final Test Speed Spec. (RPM) 4140-4860	Deviation (%)	Initial Test Noise Spec. (dB A) 59.5 Max	Final Test Noise Spec. (dB A) 59.5 Max	Deviation 3 dBMax.
33	0.28	0.29	4.7	4594	4315	-6.1	55.7	54.7	-1.0
34	0.28	0.24	-14.3	4586	4428	-3.4	55.8	54.6	-1.2
35	0.28	0.29	3.6	4577	4402	-3.8	55.2	53.8	-1.4
36	0.28	0.27	-4.9	4630	4309	-6.9	54.9	54.0	-0.9
37	0.28	0.29	3.9	4578	4330	-5.4	55.4	54.2	-1.2
38	0.27	0.25	-8.8	4591	4337	-5.5	55.7	54.4	-1.3
39	0.27	0.26	-3.7	4606	4398	-4.5	55.1	54.6	-0.5
40	0.26	0.27	2.3	4586	4353	-5.1	55.6	54.8	-0.8
41	0.28	0.28	1.4	4578	4319	-5.7	55.0	53.9	-1.1
42	0.29	0.29	0.3	4629	4379	-5.4	55.4	54.1	-1.3
43	0.30	0.27	-8.8	4585	4350	-5.1	55.7	54.3	-1.4
44	0.29	0.25	-13.2	4565	4350	-4.7	55.2	54.5	-0.7
45	0.26	0.26	0.0	4581	4472	-2.4	55.1	54.7	-0.4
46	0.28	0.27	-3.6	4555	4316	-5.2	54.9	53.8	-1.1
47	0.28	0.27	-3.9	4576	4342	-5.1	55.5	54.0	-1.5
48	0.29	0.26	-10.3	4624	4330	-6.4	55.7	54.2	-1.5
49	0.28	0.25	-10.7	4610	4290	-6.9	55.0	54.4	-0.6
50	0.32	0.28	-11.4	4573	4382	-4.2	55.2	54.6	-0.6
51	0.28	0.29	2.5	4597	4367	-5.0	54.9	54.8	-0.1
52	0.27	0.27	-1.5	4567	4368	-4.4	55.6	53.9	-1.7
53	0.28	0.29	3.9	4594	4385	-4.5	54.8	54.1	-0.7
54	0.29	0.28	-4.4	4600	4363	-5.2	55.2	54.3	-0.9
55	0.26	0.26	-0.4	4588	4329	-5.6	55.6	54.5	-1.1
56	0.26	0.27	3.8	4557	4386	-3.8	55.1	54.7	-0.4

X-Bar	0.3	0.3	-	4593.5	4355.5	-	55.31	54.29	-
σ	0.011	0.017	-	34.737	43.700	-	0.297	0.316	-

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DG13FNL085	2863.30	2014/11/17	NaNa.Wang	Tim.Yi