



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 170x150x50.8 mm series as the right table	THB1548DG-CA01				
	THB1548DG-CXKR				

Representative Test P/N : THB1548DG-CA02

Equipment: 1.Oven: E24-T0178 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)
60	40	4.00	56	2.303	6,956	8,956.0	630,925	90,132

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
		<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	
2014/7/10 9:30 AM	2016/8/13 2:03 PM				8956.0

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	11.31	1,784,526	254,932
30	8.00	1,261,851	180,264
40	4.00	630,925	90,132
50	2.00	315,463	45,066
60	1.00	157,731	22,533

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
--------------------	---

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG14FNL078	11409.00	2016/12/30	Dongqian.Liang	Tim.Yi

BGN (dBA) : 14.6

Temp (°C) : 21.5



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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 170x150x50.8 mm series as the right table

THB1548DG-CA01				
THB1548DG-CXKR				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
6,956	2014/7/10 9:30 AM	2016/8/13 2:03 PM	56	0	8956.0

Representative Test P/N : THB1548DG-CA02	Current Test Status	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
--	----------------------------	-------------------------------------	---	--------------------------------------

Equipment: 1.Oven: E24-T0178 On/Off Cycles: Every 500 hours

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 3.6Max.	Final Test Current Spec. (A) 3.6Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5220-6380	Final Test Speed Spec. (RPM) 5220-6380	Deviation (%)	Initial Test Noise Spec. (dB A) 74.0 Max	Final Test Noise Spec. (dB A) 74.0 Max	Deviation 3 dBMax.
1	1.45	1.43	-0.9	5781	5830	0.8	69.9	69.2	-0.7
2	1.43	1.42	-0.5	5945	5760	-3.1	69.9	68.3	-1.6
3	1.44	1.43	-0.9	5743	5794	0.9	70.1	69.5	-0.6
4	1.37	1.40	2.2	5791	5783	-0.1	69.8	68.3	-1.5
5	1.42	1.43	0.6	5797	5841	0.8	69.7	68.9	-0.8
6	1.40	1.43	1.8	5864	5756	-1.8	70.2	68.8	-1.4
7	1.46	1.38	-5.2	5777	5745	-0.6	69.5	69.1	-0.4
8	1.38	1.40	1.2	5904	5769	-2.3	70.5	69.6	-0.9
9	1.41	1.43	1.4	5721	5775	0.9	69.7	69.3	-0.4
10	1.33	1.45	8.5	5778	5776	0.0	70.2	68.1	-2.1
11	1.46	1.44	-1.4	5826	5844	0.3	69.5	68.6	-0.9
12	1.40	1.44	2.9	5875	5806	-1.2	70.5	69.0	-1.5
13	1.45	1.41	-2.8	5853	5762	-1.6	69.7	69.3	-0.4
14	1.39	1.46	5.4	5897	5830	-1.1	70.1	68.9	-1.2
15	1.44	1.44	0.1	5877	5836	-0.7	69.9	69.2	-0.7
16	1.39	1.37	-1.7	5807	5736	-1.2	70.3	68.4	-1.9
17	1.41	1.42	0.6	5866	5806	-1.0	70.5	68.5	-2.0
18	1.41	1.40	-0.6	5870	5748	-2.1	69.7	69.4	-0.3
19	1.44	1.42	-1.5	5835	5776	-1.0	70.0	69.2	-0.8
20	1.42	1.38	-2.3	5874	5731	-2.4	70.2	68.6	-1.6
21	1.43	1.45	1.8	5919	5827	-1.6	70.4	69.6	-0.8
22	1.37	1.44	4.6	5819	5800	-0.3	69.5	69.4	-0.1
23	1.46	1.39	-4.5	5849	5801	-0.8	69.7	69.4	-0.3
24	1.36	1.44	5.5	5851	5828	-0.4	69.9	69.5	-0.4
25	1.42	1.39	-2.0	5874	5735	-2.4	70.1	68.2	-1.9
26	1.40	1.44	2.8	5832	5829	-0.1	70.3	69.2	-1.1
27	1.39	1.39	0.5	5808	5764	-0.8	69.5	69.1	-0.4
28	1.36	1.44	5.4	5795	5820	0.4	70.5	69.2	-1.3
29	1.39	1.42	2.1	5823	5764	-1.0	69.8	68.7	-1.1
30	1.40	1.41	1.2	5761	5788	0.5	70.0	68.8	-1.2
31	1.35	1.47	8.9	5814	5882	1.2	70.2	69.0	-1.2
32	1.37	1.42	3.3	5766	5799	0.6	69.7	69.4	-0.3

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG14FNL078	11409.00	2016/12/30	Dongqian.Liang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR 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 THB 170x150x50.8 mm series as the right table				THB1548DG-CA01						
				THB1548DG-CXKR						
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)					
6,956	2014/7/10 9:30 AM	2016/8/13 2:03 PM	56	0	8956.0					
Representative Test P/N : THB1548DG-CA02				Current Test Status		<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination		
Equipment: 1.Oven: E24-T0178						On/Off Cycles: Every 500 hours				
Test Data Between Initial Test and Final Test										
Sample No.	Initial Test Current Spec. (A) 3.6Max.	Final Test Current Spec. (A) 3.6Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 6380-5220	Final Test Speed Spec. (RPM) 6380-5220	Deviation (%)	Initial Test Noise Spec. (dB A) 74.0 Max	Final Test Noise Spec. (dB A) 74.0 Max	Deviation	3 dBMax.
33	1.36	1.42	4.3	5825	5788	-0.6	69.6	68.5	-1.1	
34	1.38	1.42	3.1	5727	5798	1.2	70.0	68.6	-1.4	
35	1.37	1.43	4.7	5839	5835	-0.1	69.5	69.3	-0.2	
36	1.40	1.46	3.7	5846	5839	-0.1	69.8	69.0	-0.8	
37	1.41	1.37	-2.5	5871	5739	-2.2	70.1	69.4	-0.7	
38	1.40	1.35	-4.1	5808	5735	-1.3	70.4	69.0	-1.4	
39	1.37	1.39	1.4	5777	5741	-0.6	69.6	69.3	-0.3	
40	1.41	1.40	-1.1	5790	5792	0.0	69.8	69.3	-0.5	
41	1.35	1.46	8.2	5766	5831	1.1	70.0	68.2	-1.8	
42	1.40	1.41	0.8	5809	5750	-1.0	70.2	69.1	-1.1	
43	1.40	1.46	4.1	5828	5810	-0.3	69.5	69.2	-0.3	
44	1.42	1.44	1.1	5842	5770	-1.2	70.4	68.9	-1.5	
45	1.36	1.40	3.1	5772	5734	-0.7	69.6	69.4	-0.2	
46	1.35	1.41	3.8	5761	5735	-0.5	69.8	68.2	-1.6	
47	1.38	1.48	6.7	5791	5833	0.7	70.1	68.6	-1.5	
48	1.38	1.46	6.2	5790	5831	0.7	69.9	68.7	-1.2	
49	1.44	1.45	0.3	5825	5767	-1.0	70.3	68.6	-1.7	
50	1.37	1.46	6.4	5823	5770	-0.9	69.6	68.8	-0.8	
51	1.41	1.42	0.8	5765	5742	-0.4	70.5	69.0	-1.5	
52	1.40	1.45	3.6	5893	5779	-1.9	69.8	69.1	-0.7	
53	1.41	1.45	2.2	5842	5806	-0.6	70.0	69.7	-0.3	
54	1.35	1.41	3.9	5752	5746	-0.1	69.6	68.7	-0.9	
55	1.41	1.45	2.7	5808	5823	0.3	70.4	69.6	-0.8	
56	1.38	1.38	-0.1	5777	5690	-1.5	69.7	69.4	-0.3	
X-Bar	1.40	1.42	-	5820.0	5786.16	-	69.96	68.99	-	
σ	0.031	0.028	-	48.950	39.539	-	0.317	0.420	-	
QE File No.	Time-out for function test or others (hrs)			Issued Date		Reported By		Approved By		
DG14FNL078	11409.00			2016/12/30		Dongqian.Liang		Tim.Yi		