



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 THA 120x120x38.0 mm series as the right table					
--	--	--	--	--	--

Representative Test P/N : THA1248BE

Equipment: 1.Oven: E24-T0169 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)	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	360.0	25,361	3,623

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2011/5/9 1:30 PM	2012/2/25 9:03 AM	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	360.0

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	71,732	10,247
30	8.00	50,722	7,246
40	4.00	25,361	3,623
50	2.00	12,680	1,811
60	1.00	6,340	906

- Fan permission criteria for the measurement after test :
- Speed can not drop of $\geq 15\%$ below the original measured rpm.
 - Current cannot increase $> 15\%$ of original measure current.
 - Noise cannot $> 3\text{dB}$ 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
DG11FNL049	48.00	2011/5/29	Nan Yang	Long Zhao



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 THA 120x120x38.0 mm series as the right table

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
6,956	2011/5/9 1:30 PM	2012/2/25 9:03 AM	56	0	360.0
Representative Test P/N : THA1248BE			Current Test Status		<input checked="" type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0169				On/Off Cycles: Every 500 hours	

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 2.49 Max.	Final Test Current Spec. (A) 2.49 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 6840-8360	Final Test Speed Spec. (RPM) 6840-8360	Deviation (%)	Initial Test Noise Spec. (dB A) 76.0 Max	Final Test Noise Spec. (dB A) 76.0 Max	Deviation 3 dBMax.
1	2.05	2.07	1.1	7670	7685	0.2	72.2	73.3	1.1
2	2.04	2.05	0.0	7659	7697	0.5	72.0	74.3	2.3
3	2.02	2.05	1.1	7648	7647	0.0	72.0	73.7	1.7
4	1.96	2.05	4.8	7581	7664	1.1	71.8	73.5	1.7
5	1.95	1.99	2.0	7505	7737	3.1	71.9	73.5	1.6
6	1.97	1.96	-0.6	7700	7696	-0.1	71.9	73.7	1.8
7	1.88	1.87	-0.2	7425	7464	0.5	72.2	73.3	1.1
8	2.01	1.99	-0.9	7660	7686	0.3	72.0	73.4	1.4
9	1.96	1.90	-3.1	7579	7483	-1.3	71.7	73.9	2.2
10	1.96	1.96	0.3	7572	7695	1.6	72.0	73.5	1.5
11	2.03	1.99	-1.8	7675	7593	-1.1	71.8	73.0	1.2
12	1.98	1.97	-0.5	7655	7688	0.4	71.9	73.5	1.6
13	1.94	2.01	3.8	7558	7719	2.1	71.8	73.3	1.5
14	2.02	2.00	-0.7	7645	7619	-0.3	72.0	73.5	1.5
15	2.03	1.95	-3.6	7660	7686	0.3	72.2	73.9	1.7
16	2.03	2.07	2.3	7608	7731	1.6	72.0	73.4	1.4
17	2.02	2.04	1.0	7633	7663	0.4	71.8	73.1	1.3
18	2.07	2.02	-2.2	7700	7614	-1.1	71.9	73.5	1.6
19	2.05	2.01	-2.2	7595	7757	2.1	71.8	73.0	1.2
20	1.90	2.03	7.1	7590	7739	2.0	71.7	73.7	2.0
21	1.94	2.06	6.2	7542	7769	3.0	71.5	73.4	1.9
22	1.97	1.85	-5.9	7651	7485	-2.2	72.0	73.5	1.5
23	1.97	1.96	-0.3	7383	7665	3.8	72.0	74.0	2.0
24	1.97	1.98	0.3	7567	7608	0.5	72.1	73.1	1.0
25	1.96	1.87	-4.5	7560	7448	-1.5	72.0	73.5	1.5
26	2.02	1.98	-1.7	7697	7657	-0.5	71.7	73.5	1.8
27	2.02	1.97	-2.1	7646	7601	-0.6	71.5	73.2	1.7
28	1.99	1.99	0.2	7679	7775	1.3	71.9	73.9	2.0
29	1.91	2.00	4.8	7584	7684	1.3	72.2	74.0	1.8
30	1.98	1.98	0.4	7574	7743	2.2	72.0	73.7	1.7
31	1.93	1.90	-1.3	7611	7479	-1.7	71.8	73.5	1.7
32	2.04	1.97	-3.4	7671	7559	-1.5	71.9	73.3	1.4
33	1.96	1.93	-1.3	7613	7726	1.5	71.7	73.9	2.2
34	2.00	2.09	4.6	7783	7725	-0.7	71.9	73.7	1.8
35	1.97	2.00	1.7	7614	7682	0.9	72.0	74.0	2.0

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG11FNL049	48.00	2011/5/29	Nan Yang	Long Zhao



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 THA 120x120x38.0 mm series as the right table

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
6,956	2011/5/9 1:30 PM	2012/2/25 9:03 AM	56	0	360.0
Representative Test P/N : THA1248BE			Current Test Status		<input checked="" type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0169				On/Off Cycles: Every 500 hours	

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 2.49 Max.	Final Test Current Spec. (A) 2.49 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 6840-8360	Final Test Speed Spec. (RPM) 6840-8360	Deviation (%)	Initial Test Noise Spec. (dB A) 76.0 Max	Final Test Noise Spec. (dB A) 76.0 Max	Deviation
36	1.89	2.05	8.6	7549	7784	3.1	71.7	73.7	2.0
37	1.92	2.00	4.2	7592	7658	0.9	71.9	73.9	2.0
38	2.02	1.89	-6.6	7701	7421	-3.6	72.0	73.5	1.5
39	1.95	1.89	-3.0	7617	7474	-1.9	71.8	73.0	1.2
40	2.05	2.04	-0.4	7688	7643	-0.6	71.7	73.7	2.0
41	2.04	1.94	-4.8	7711	7498	-2.8	71.9	73.1	1.2
42	2.04	2.00	-2.0	7667	7751	1.1	72.0	73.5	1.5
43	1.93	2.02	4.3	7561	7716	2.0	72.1	73.7	1.6
44	2.03	2.03	-0.1	7702	7740	0.5	72.0	73.5	1.5
45	1.92	1.97	2.3	7574	7624	0.7	72.2	73.4	1.2
46	1.95	2.03	4.3	7512	7651	1.9	71.8	73.9	2.1
47	2.00	1.95	-2.5	7652	7688	0.5	71.9	73.5	1.6
48	2.08	1.96	-5.9	7697	7654	-0.6	71.7	73.7	2.0
49	2.07	2.03	-2.3	7675	7653	-0.3	71.9	73.5	1.6
50	1.93	2.08	7.4	7645	7683	0.5	71.8	73.1	1.3
51	2.01	2.07	2.7	7623	7719	1.3	71.7	73.7	2.0
52	1.88	1.92	1.9	7573	7470	-1.4	72.8	74.0	1.2
53	1.99	2.04	2.5	7675	7763	1.1	71.7	73.5	1.8
54	1.86	1.85	-0.4	7615	7434	-2.4	71.7	73.4	1.7
55	1.98	1.98	0.1	7574	7684	1.5	71.9	73.9	2.0
56	1.93	1.85	-4.2	7611	7430	-2.4	72.0	73.0	1.0
X-Bar	1.981	1.984	-	7619.8	7643.0	-	71.91	73.54	-
σ	0.054	0.062	-	70.082	102.168	-	0.204	0.301	-

QE File No.	Time-out for function test or others (hrs)	Issued Date	Reported By	Approved By
DG11FNL049	48.00	2011/5/29	Nan Yang	Long Zhao