



# 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 THD 92x92x38.0mm series as the right table					
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**Representative Test P/N : THD0924HEP6**

**Equipment: 1.Oven: E24-T0161**

⊙ **L<sub>10</sub> 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<sub>r;c</sub>) 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 <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°C)	Acceleration Factor A <sub>F</sub>	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B <sub>r;c</sub>	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
70	40	8.00	56	2.303	3,478	2,360.0	332,511	47,502

### Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2022/6/9 4:30 PM	2022/12/26 1:46 PM	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	2360.0

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' L<sub>10</sub> 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 <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	22.63	940,483	134,355
30	16.00	665,022	95,003
40	8.00	332,511	47,502
50	4.00	166,255	23,751
60	2.00	83,128	11,875
70	1.00	41,564	5,938

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.

<b>Test Result</b>	<input checked="" type="checkbox"/> <b>Accept</b> <input type="checkbox"/> <b>Reject</b>
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG22FNL051	1319.50	2022/11/10	Loly.Wang	Tim.Yi

BGN (dBA) : 16.1

Temp (°C) : 24.3



## 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 THD 92x92x38.0mm series as the right table									
<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>				
3,478	2022/6/9 4:30 PM	2022/12/26 1:46 PM	56	0	<b>2360.0</b>				
Representative Test P/N : THD0924HEP6			<b>Current Test Status</b>		<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)		<input type="checkbox"/> Termination	
Equipment: 1.Oven: E24-T0161									
<b>Test Data Between Initial Test and Final Test</b>									
Sample No.	Initial Test Current Spec. (A) <b>1.38 Max.</b>	Final Test Current Spec. (A) <b>1.38 Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>9630-11770</b>	Final Test Speed Spec. (RPM) <b>9630-11770</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>67.0 Max</b>	Final Test Noise Spec. (dB A) <b>67.0 Max</b>	Deviation <b>3 dBMax.</b>
1	1.12	1.13	0.5	10348	10477	1.2	67.1	67.2	0.1
2	1.08	1.10	1.5	10301	10407	1.0	66.8	67.0	0.2
3	1.15	1.10	-3.7	10388	10382	-0.1	67.3	68.3	1.0
4	1.09	1.13	3.2	10054	10343	2.9	67.0	67.1	0.1
5	1.13	1.10	-2.6	10400	10292	-1.0	66.1	67.0	0.9
6	1.13	1.11	-1.5	10329	10291	-0.4	66.8	67.2	0.4
7	1.13	1.12	-1.1	10439	10294	-1.4	66.3	66.9	0.6
8	1.11	1.11	-0.6	10363	10332	-0.3	66.2	67.4	1.2
9	1.10	1.10	0.3	10406	10435	0.3	67.2	67.5	0.3
10	1.13	1.12	-0.7	10434	10432	0.0	66.0	67.5	1.5
11	1.12	1.12	-0.2	10349	10363	0.1	67.2	67.5	0.3
12	1.16	1.12	-3.2	10449	10336	-1.1	67.2	65.8	-1.4
13	1.12	1.11	-1.2	10383	10472	0.9	66.5	67.2	0.7
14	1.12	1.10	-1.8	10417	10326	-0.9	66.7	66.9	0.2
15	1.18	1.12	-4.9	10569	10278	-2.8	66.8	67.0	0.2
16	1.14	1.10	-3.6	10385	10392	0.1	67.7	67.6	-0.1
17	1.15	1.12	-2.7	10433	10195	-2.3	67.4	68.1	0.7
18	1.09	1.11	2.1	10312	10319	0.1	66.0	67.0	1.0
19	1.13	1.11	-1.9	10388	10284	-1.0	66.5	66.4	-0.1
20	1.13	1.10	-2.3	10390	10377	-0.1	67.0	66.5	-0.5
21	1.14	1.10	-3.2	10324	10264	-0.6	65.8	66.3	0.5
22	1.12	1.06	-5.4	10317	10769	4.4	66.4	67.0	0.6
23	1.11	1.12	1.2	10417	10379	-0.4	66.8	67.2	0.4
24	1.13	1.12	-1.2	10383	10432	0.5	66.7	67.0	0.3
25	1.11	1.11	0.1	10345	10339	-0.1	67.3	66.8	-0.5
26	1.12	1.14	1.5	10436	10342	-0.9	66.8	67.9	1.1
27	1.14	1.11	-2.7	10413	10324	-0.9	66.8	67.6	0.8
28	1.12	1.09	-2.5	10356	10287	-0.7	66.5	67.5	1.0
29	1.12	1.12	0.5	10316	10342	0.3	66.2	66.5	0.3
30	1.13	1.10	-2.2	10352	10389	0.4	67.6	66.8	-0.8
31	1.14	1.09	-4.3	10460	10281	-1.7	66.2	66.8	0.6
32	1.13	1.10	-2.5	10406	10348	-0.6	66.3	66.3	0.0
<b>QE File No.</b>	<b>Time-out for function test or others (hours)</b>		<b>Issued Date</b>		<b>Reported By</b>		<b>Approved By</b>		
DG22FNL051	1319.50		2022/11/10		Loly.Wang		Tim.Yi		



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>
3,478	2022/6/9 4:30 PM	2022/12/26 1:46 PM	56	0	<b>2360.0</b>
Representative Test P/N : THD0924HEP6			<b>Current Test Status</b>		<input checked="" type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0161					

### 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.
	<b>1.38 Max.</b>	<b>1.38 Max.</b>		<b>9630-11770</b>	<b>9630-11770</b>		<b>67.0 Max</b>	<b>67.0 Max</b>	
33	1.13	1.12	-1.0	10501	10289	-2.0	66.8	66.7	-0.1
34	1.13	1.11	-1.8	10324	10255	-0.7	66.5	67.3	0.8
35	1.13	1.10	-2.7	10412	10278	-1.3	66.5	67.0	0.5
36	1.13	1.12	-0.8	10374	10309	-0.6	67.5	67.5	0.0
37	1.09	1.10	0.2	10384	10293	-0.9	66.7	65.9	-0.8
38	1.14	1.13	-1.2	10380	10368	-0.1	67.2	67.0	-0.2
39	1.11	1.08	-2.4	10426	10277	-1.4	67.0	66.6	-0.4
40	1.12	1.17	4.7	10436	10479	0.4	66.4	67.5	1.1
41	1.14	1.14	0.3	10456	10316	-1.3	66.3	67.6	1.3
42	1.13	1.18	3.8	10356	10654	2.9	66.2	67.1	0.9
43	1.12	1.12	-0.7	10346	10360	0.1	66.2	67.4	1.2
44	1.14	1.14	-0.4	10470	10426	-0.4	65.8	66.8	1.0
45	1.10	1.15	3.8	10361	10393	0.3	67.1	66.7	-0.4
46	1.12	1.12	-0.1	10401	10303	-0.9	67.0	67.2	0.2
47	1.11	1.11	0.0	10342	10480	1.3	66.8	67.4	0.6
48	1.10	1.11	0.7	10347	10274	-0.7	67.4	67.2	-0.2
49	1.13	1.11	-1.8	10392	10334	-0.6	66.8	67.5	0.7
50	1.13	1.14	1.0	10456	10378	-0.7	66.0	67.7	1.7
51	1.16	1.10	-5.1	10442	10252	-1.8	67.4	67.6	0.2
52	1.11	1.11	-0.6	10339	10435	0.9	66.8	67.3	0.5
53	1.12	1.11	-0.7	10444	10441	0.0	67.3	67.1	-0.2
54	1.12	1.10	-2.1	10380	10281	-1.0	66.7	67.5	0.8
55	1.12	1.11	-0.7	10342	10304	-0.4	66.1	67.3	1.2
56	1.10	1.07	-2.9	10389	10230	-1.5	65.9	65.7	-0.2
X-Bar	1.12	1.11	-	10385.04	10355.93	-	66.71	67.10	-
$\sigma$	0.02	0.02	-	67.31	95.92	-	0.49	0.52	-

<b>QE File No.</b>	<b>Time-out for function test or others (hrs)</b>	<b>Issued Date</b>	<b>Reported By</b>	<b>Approved By</b>
DG22FNL051	1319.50	2022/11/10	Loly.Wang	Tim.Yi