



DC FAN CUSTOMIZED 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 THD 60x60x38.0 mm series as the right table	THD0612VE-00EB7				
	THD0612VE-00E3B				
	THD0612VE-00EB6				

Representative Test P/N : THD0612VE-00E3C	
Equipment: 1.Oven: E24-F0108	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 ≅ 1.89×L₁₀ = 132,300 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,

$$t = 1.119 \times \text{MTTF} \times [(B_{r,c}) \div n]^{0.33} \div A_F, \text{ and } A_F = 1.5^{(T_s - T_u)/10}$$

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 MTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
85	40	6.20	56	2.303	8,330	2,230.0	35,419	18,740

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2018/6/13 4:00 PM	2019/9/4 3:47 AM	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	2230.0

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 MTF (hours)	Estimated L ₁₀ (hours)
25	11.39	65,068	34,428
30	9.30	53,128	28,110
40	6.20	35,419	18,740
50	4.13	23,612	12,493
55	3.38	19,279	10,201
60	2.76	15,742	8,329
70	1.84	10,494	5,553
80	1.22	6,996	3,702
85	1.00	5,712	3,022

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 Method according to IPC-9591.

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
DG18FNL047	2410.00	2018/12/24	Poppy.Liang	Tim.Yi

BGN (dBA) :16.0

Temp (°C) : 22.3



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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	THD0612VE-00E3B				
	THD0612VE-00EB6				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
8,330	2018/6/13 4:00 PM	2019/9/4 3:47 AM	56	0	2230.0

Representative Test P/N : THD0612VE-00E3C	Current Test Status	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
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Equipment: 1.Oven: E24-F0108	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) 3.48 Max.	Final Test Current Spec. (A) 3.48 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 17550-21450	Final Test Speed Spec. (RPM) 17550-21450	Deviation (%)	Initial Test Noise Spec. (dB A) 70.1 Max	Final Test Noise Spec. (dB A) 70.1 Max	Deviation 3 dBMax.
1	2.67	2.92	9.5	19361	19480	0.6	68.8	67.0	-1.8
2	2.65	2.81	6.1	19273	19485	1.1	67.0	67.2	0.2
3	2.71	3.10	14.6	19491	19439	-0.3	69.3	66.9	-2.4
4	2.71	2.78	2.6	19437	19473	0.2	68.0	67.3	-0.7
5	2.74	2.81	2.7	19516	19239	-1.4	68.5	67.0	-1.5
6	2.74	2.88	5.0	19418	19497	0.4	68.0	67.6	-0.4
7	2.72	2.91	7.1	19447	19550	0.5	67.9	67.0	-0.9
8	2.73	2.74	0.2	19524	19014	-2.6	68.0	67.4	-0.6
9	2.67	2.80	4.7	19487	19393	-0.5	67.6	67.1	-0.5
10	2.76	2.79	1.2	19302	19253	-0.3	67.6	66.8	-0.8
11	2.66	2.89	9.0	19511	19512	0.0	67.8	67.6	-0.2
12	2.71	2.89	6.6	19313	19494	0.9	67.5	67.3	-0.2
13	2.67	2.88	7.7	19492	19480	-0.1	67.7	68.0	0.3
14	2.76	2.86	3.7	19221	19387	0.9	67.2	66.0	-1.2
15	2.66	2.84	6.6	19161	19491	1.7	67.0	65.9	-1.1
16	2.67	2.90	8.7	19398	19527	0.7	67.8	66.9	-0.9
17	2.61	2.88	10.5	19066	19450	2.0	68.2	67.5	-0.7
18	2.62	2.92	11.3	19512	19529	0.1	67.4	67.1	-0.3
19	2.61	2.81	7.9	19404	19339	-0.3	67.8	67.2	-0.6
20	2.73	2.84	4.0	19493	19450	-0.2	68.0	66.7	-1.3
21	2.76	2.91	5.6	19440	19463	0.1	66.9	66.8	-0.1
22	2.66	2.96	11.4	19421	19500	0.4	68.0	68.3	0.3
23	2.65	2.89	8.7	19433	19376	-0.3	68.5	67.6	-0.9
24	2.78	2.82	1.7	19555	19256	-1.5	66.7	67.2	0.5
25	2.68	2.86	7.0	19495	19472	-0.1	66.8	66.7	-0.1
26	2.63	2.87	9.1	19236	19485	1.3	66.9	66.1	-0.8
27	2.59	2.95	13.9	19044	19498	2.4	67.2	67.4	0.2
28	2.74	2.92	6.8	19483	19500	0.1	67.0	66.6	-0.4
29	2.62	2.85	8.6	19125	19436	1.6	66.8	68.0	1.2
30	2.73	2.92	7.1	19550	19501	-0.3	68.3	68.0	-0.3
31	2.67	2.86	7.2	19184	19401	1.1	67.0	67.2	0.2
32	2.72	2.80	3.0	19458	19162	-1.5	67.5	67.0	-0.5

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG18FNL047	2410.00	2018/12/24	Poppy.Liang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				THD0612VE-00EB6					
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8,330	2018/6/13 4:00 PM	2019/9/4 3:47 AM	56	0	2230.0				
Representative Test P/N : THD0612VE-00E3C				Current Test Status		<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	
Equipment: 1.Oven: E24-F0108				On/Off Cycles: Every 500 hours					
Test Data Between Initial Test and Final Test									
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33	2.68	2.75	2.3	19451	19014	-2.2	69.3	67.5	-1.8
34	2.67	2.89	8.5	19283	19438	0.8	67.7	67.0	-0.7
35	2.63	2.83	7.6	19442	19275	-0.9	66.0	66.5	0.5
36	2.70	2.86	6.0	19493	19458	-0.2	67.8	67.2	-0.6
37	2.74	2.83	3.3	19526	19358	-0.9	66.8	66.9	0.1
38	2.69	2.90	8.0	19511	19498	-0.1	67.1	66.8	-0.3
39	2.71	2.91	7.2	19551	19477	-0.4	66.6	67.3	0.7
40	2.79	2.77	-0.6	19451	19119	-1.7	67.3	66.4	-0.9
41	2.78	2.80	0.7	19488	19077	-2.1	68.0	67.0	-1.0
42	2.70	2.83	4.8	19470	19433	-0.2	66.9	66.3	-0.6
43	2.78	2.85	2.8	19544	19453	-0.5	66.7	66.4	-0.3
44	2.71	2.98	10.1	19543	19472	-0.4	67.8	67.9	0.1
45	2.68	2.79	4.3	19334	19333	0.0	66.5	66.8	0.3
46	2.79	2.79	0.0	19513	19234	-1.4	66.6	66.7	0.1
47	2.63	2.87	9.1	19310	19372	0.3	66.2	67.1	0.9
48	2.66	2.89	8.6	19549	19504	-0.2	67.2	67.4	0.2
49	2.66	2.85	7.0	19411	19173	-1.2	67.0	66.5	-0.5
50	2.66	2.90	9.3	19467	19506	0.2	67.5	66.7	-0.8
51	2.68	2.78	3.9	19453	18971	-2.5	67.4	67.7	0.3
52	2.72	2.87	5.7	19421	19280	-0.7	67.1	67.7	0.6
53	2.65	2.91	9.9	19386	19509	0.6	66.9	67.3	0.4
54	2.68	2.80	4.6	19533	19128	-2.1	66.5	67.8	1.3
55	2.62	2.90	10.9	19193	19477	1.5	66.5	66.8	0.3
56	2.70	2.75	1.9	19403	19204	-1.0	66.7	67.1	0.4
X-Bar	2.69	2.86	-	19410.30	19380.27	-	67.41	67.09	-
σ	0.05	0.06	-	129.89	143.31	-	0.65	0.52	-
QE File No.		Time-out for function test or others (hrs)		Issued Date		Reported By		Approved By	
DG18FNL047		2410.00		2018/12/24		Poppy.Liang		Tim.Yi	