



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 92X92X38.0 mm series as the right table	THD0948HE-AFER	THD0948HE-AWJN		
	THD0948HE-A			
	THD0948HE-DH99			
	THD0948HE-AXHH			

Representative Test P/N : THD0948HE-DH31	
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 MTTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
70	40	3.38	27	2.303	19,468	16,535.0	112,368	59,454

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2017/3/11 11:30 AM	2020/12/14 5:04 AM	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	16535.0

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	6.20	206,432	109,223
30	5.06	168,551	89,181
40	3.38	112,368	59,454
50	2.25	74,912	39,636
55	1.84	61,165	32,363
60	1.50	49,941	26,424
70	1.00	33,294	17,616
80	0.67	22,196	11,744
85	0.54	18,123	9,589

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
DG17FNL027	13501.50	2020/8/14	Loly.Wang	Tim.Yi

BGN (dBA) : 15.9

Temp (°C) : 25.0



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				THD0948HE-A						
				THD0948HE-DH99						
				THD0948HE-AXHH						
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)					
19,468	2017/3/11 11:30 AM	2020/12/14 5:04 AM	27	0	16535.0					
Representative Test P/N : THD0948HE-DH31				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										
Sample No.	Initial Test Current Spec. (A) 1.5 Max.	Final Test Current Spec. (A) 1.5 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 12150-14300	Final Test Speed Spec. (RPM) 12150-14300	Deviation (%)	Initial Test Noise Spec. (dB A) 75.0 Max.	Final Test Noise Spec. (dB A) 75.0 Max.	Deviation 3 dBMax.	
1	1.048	1.099	4.9	13528	13350	-1.3	71.0	72.3	1.3	
2	0.993	1.100	10.8	13415	13279	-1.0	71.1	72.4	1.3	
3	1.048	1.095	4.5	13471	13453	-0.1	72.0	72.6	0.6	
4	1.037	1.019	-1.7	13498	13435	-0.5	71.4	72.1	0.7	
5	1.023	1.114	8.9	13527	13492	-0.3	72.0	74.6	2.6	
6	1.039	1.135	9.2	13543	13422	-0.9	70.5	72.0	1.5	
7	0.996	1.044	4.8	13307	13271	-0.3	70.4	72.5	2.1	
8	1.073	1.120	4.4	13487	13467	-0.1	70.8	72.3	1.5	
9	1.027	1.099	7.0	13388	13228	-1.2	70.9	72.4	1.5	
10	1.022	1.097	7.3	13532	13480	-0.4	72.1	74.8	2.7	
11	1.029	1.079	4.9	13486	13373	-0.8	71.8	71.3	-0.5	
12	0.983	1.059	7.7	13340	13174	-1.2	71.0	72.0	1.0	
13	1.037	1.097	5.8	13370	13445	0.6	71.0	71.9	0.9	
14	1.028	1.118	8.8	13639	13481	-1.2	70.8	72.0	1.2	
15	1.052	1.120	6.5	13510	13493	-0.1	71.8	72.5	0.7	
16	1.028	1.102	7.2	13518	13499	-0.1	71.0	73.5	2.5	
17	1.035	1.142	10.3	13508	13409	-0.7	71.5	73.2	1.7	
18	1.028	1.142	11.1	13492	13492	0.0	71.4	72.6	1.2	
19	1.063	1.121	5.5	13518	13381	-1.0	72.0	72.3	0.3	
20	1.030	1.127	9.4	13508	13384	-0.9	72.0	74.3	2.3	
21	1.049	1.081	3.1	13506	13522	0.1	72.4	72.2	-0.2	
22	1.031	1.116	8.2	13447	13465	0.1	71.8	72.4	0.6	
23	1.012	1.109	9.6	13455	13393	-0.5	71.7	72.2	0.5	
24	1.043	1.112	6.6	13480	13460	-0.1	72.5	72.3	-0.2	
25	1.048	1.111	6.0	13422	13439	0.1	72.9	72.5	-0.4	
26	1.037	1.091	5.2	13508	13378	-1.0	72.2	74.5	2.3	
27	1.017	1.071	5.3	13510	13432	-0.6	71.2	72.3	1.1	
X-Bar	1.03	1.10	-	13478.26	13411.00	-	71.53	72.67	-	
σ	0.02	0.03	-	69.10	87.21	-	0.64	0.89	-	
QE File No.	Time-out for function test or others (hours)			Issued Date		Reported By		Approved By		
DG17FNL027	13501.50			2020/8/14		Loly.Wang		Tim.Yi		