



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 EUB 92x92x32.0mm series as the right table					
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Representative Test P/N : EUB0912HF-03GCU
Equipment: 1.Oven: E24-T0161

⊙ **L₁₀ Expectancy: 50,000 hours minimum @ fan rated voltage and the temperature of 40°C**
 According to the equation for **Weibull distribution**, **MTTF ≐ 7×L10 = 350,000 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)
70	40	8.00	56	2.303	2,484	2,484.0	349,982	49,997

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2021/2/6 4:00 PM	2021/7/15 12:07 AM	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	2484.0

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	22.63	989,898	141,414
30	16.00	699,964	99,995
40	8.00	349,982	49,997
50	4.00	174,991	24,999
60	2.00	87,495	12,499
70	1.00	43,748	6,250

- Fan permission criteria for the measurement after test :
- Speed can not drop of ≥ 15% below the original measured rpm.
 - Current cannot increase > 15% of original measure current.
 - Noise cannot >3dB over the original measure noise.

Test Result
 Accept
 Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG21FNL008	1316.00	2021/7/15	Loly.Wang	Tim.Yi

BGN (dBA) : 15.8

Temp (°C) : 25.0



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)					
2,484	2021/2/6 4:00 PM	2021/7/15 12:07 AM	56	0	2484.0					
Representative Test P/N : EUB0912HF-03GCU			Current Test Status		<input type="checkbox"/> In process	<input checked="" 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) 0.16 Max.	Final Test Current Spec. (A) 0.16 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 3015-3685	Final Test Speed Spec. (RPM) 3015-3685	Deviation (%)	Initial Test Noise Spec. (dB A) 37.5 Max	Final Test Noise Spec. (dB A) 37.5 Max	Deviation 3 dBMax.	
1	0.126	0.119	-5.6	3330	3307	-0.7	33.5	32.3	-1.2	
2	0.134	0.122	-9.0	3362	3393	0.9	34.4	33.7	-0.7	
3	0.135	0.128	-5.2	3363	3340	-0.7	34.2	32.6	-1.6	
4	0.138	0.123	-10.9	3331	3409	2.3	33.2	33.2	0.0	
5	0.129	0.122	-5.4	3319	3399	2.4	32.7	33.6	0.9	
6	0.135	0.124	-8.1	3339	3378	1.2	33.4	32.8	-0.6	
7	0.133	0.121	-9.0	3323	3357	1.0	33.4	33.2	-0.2	
8	0.136	0.120	-11.8	3348	3419	2.1	33.7	33.1	-0.6	
9	0.134	0.121	-9.7	3344	3368	0.7	33.6	32.5	-1.1	
10	0.135	0.121	-10.4	3324	3394	2.1	33.6	32.9	-0.7	
11	0.133	0.139	4.5	3345	3126	-6.5	33.5	32.3	-1.2	
12	0.134	0.121	-9.7	3371	3426	1.6	33.7	33.1	-0.6	
13	0.137	0.124	-9.5	3352	3378	0.8	33.8	33.1	-0.7	
14	0.131	0.122	-6.9	3341	3334	-0.2	34.0	33.4	-0.6	
15	0.134	0.118	-11.9	3335	3391	1.7	34.2	33.3	-0.9	
16	0.131	0.120	-8.4	3325	3368	1.3	33.3	32.3	-1.0	
17	0.134	0.120	-10.4	3330	3387	1.7	33.0	32.4	-0.6	
18	0.129	0.121	-6.2	3237	3349	3.5	32.8	33.1	0.3	
19	0.131	0.124	-5.3	3339	3318	-0.6	32.1	32.8	0.7	
20	0.132	0.121	-8.3	3353	3351	-0.1	33.7	33.0	-0.7	
21	0.140	0.125	-10.7	3350	3410	1.8	33.9	33.4	-0.5	
22	0.130	0.120	-7.7	3307	3338	0.9	34.2	32.8	-1.4	
23	0.138	0.124	-10.1	3329	3381	1.6	33.8	32.7	-1.1	
24	0.130	0.119	-8.5	3308	3351	1.3	32.7	32.6	-0.1	
25	0.132	0.119	-9.8	3323	3376	1.6	34.7	32.9	-1.8	
26	0.134	0.121	-9.7	3316	3377	1.8	34.4	32.7	-1.7	
27	0.131	0.120	-8.4	3308	3342	1.0	33.8	32.3	-1.5	
28	0.129	0.123	-4.7	3290	3322	1.0	33.4	32.6	-0.8	
29	0.133	0.120	-9.8	3332	3372	1.2	33.8	33.5	-0.3	
30	0.132	0.120	-9.1	3319	3369	1.5	34.2	32.5	-1.7	
31	0.136	0.124	-8.8	3330	3348	0.5	33.7	32.3	-1.4	
32	0.131	0.123	-6.1	3341	3354	0.4	32.7	32.7	0.0	
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By			
DG21FNL008	1316.00		2021/7/15		Loly.Wang		Tim.Yi			



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2,484	2021/2/6 4:00 PM	2021/7/15 12:07 AM	56	0	2484.0
Representative Test P/N : EUB0912HF-03GCU			Current Test Status		<input type="checkbox"/> In process <input checked="" 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) 0.16 Max.	Final Test Current Spec. (A) 0.16 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 3015-3685	Final Test Speed Spec. (RPM) 3015-3685	Deviation (%)	Initial Test Noise Spec. (dB A) 37.5 Max	Final Test Noise Spec. (dB A) 37.5 Max	Deviation 3 dBMax.
33	0.130	0.120	-7.7	3350	3366	0.5	33.5	32.1	-1.4
34	0.129	0.124	-3.9	3331	3328	-0.1	32.6	32.4	-0.2
35	0.135	0.123	-8.9	3350	3375	0.7	33.6	33.3	-0.3
36	0.130	0.120	-7.7	3353	3378	0.7	33.2	32.5	-0.7
37	0.129	0.116	-10.1	3319	3361	1.3	32.5	32.0	-0.5
38	0.132	0.121	-8.3	3334	3374	1.2	33.2	32.1	-1.1
39	0.133	0.126	-5.3	3366	3357	-0.3	33.2	33.0	-0.2
40	0.132	0.120	-9.1	3298	3350	1.6	33.5	32.2	-1.3
41	0.129	0.119	-7.8	3300	3309	0.3	33.1	33.0	-0.1
42	0.131	0.121	-7.6	3344	3383	1.2	34.3	33.2	-1.1
43	0.135	0.124	-8.1	3351	3380	0.9	33.8	32.1	-1.7
44	0.132	0.119	-9.8	3353	3400	1.4	33.6	33.2	-0.4
45	0.136	0.125	-8.1	3348	3374	0.8	33.4	33.0	-0.4
46	0.131	0.119	-9.2	3330	3383	1.6	34.2	33.7	-0.5
47	0.134	0.122	-9.0	3357	3404	1.4	32.9	32.7	-0.2
48	0.134	0.121	-9.7	3372	3439	2.0	33.9	33.6	-0.3
49	0.131	0.119	-9.2	3316	3342	0.8	34.4	32.2	-2.2
50	0.131	0.120	-8.4	3273	3339	2.0	33.0	32.9	-0.1
51	0.132	0.122	-7.6	3358	3374	0.5	33.3	32.9	-0.4
52	0.131	0.116	-11.5	3352	3420	2.0	33.9	33.8	-0.1
53	0.130	0.117	-10.0	3311	3363	1.6	33.7	32.7	-1.0
54	0.134	0.127	-5.2	3374	3388	0.4	33.2	32.9	-0.3
55	0.133	0.122	-8.3	3323	3353	0.9	33.6	33.0	-0.6
56	0.131	0.124	-5.3	3310	3318	0.2	32.7	33.5	0.8
X-Bar	0.13	0.12	-	3332.80	3364.11	-	33.53	32.85	-
σ	0.00	0.00	-	25.13	43.50	-	0.56	0.45	-

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DG21FNL008	1316.00	2021/7/15	Loly.Wang	Tim.Yi