



# 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 toEUB 125.4X125.4X52mm series as the right table				
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<b>Representative Test P/N : EUB1312ME-07G8E (A BOM)</b>				
<b>Equipment: 1.Oven: E24-T0161</b>				

◎ **L<sub>10</sub> 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<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	55	2.303	2,525	4,484.0	621,496	88,785

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2020/6/26 9:00 AM	2020/11/11 12:07 AM	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	<b>4484.0</b>

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	1,757,856	251,122
30	16.00	1,242,992	177,570
40	8.00	621,496	88,785
50	4.00	310,748	44,393
60	2.00	155,374	22,196
70	1.00	77,687	11,098

- 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
DG20FNL044	2155.00	2021/3/30	Poppy.Liang	Tim.Yi

BGN (dBA) : 15.9

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 EUB 125.4X125.4X52mm 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>				
2,525	2020/6/26 9:00 AM	2020/11/11 12:07 AM	55	0	<b>4484.0</b>				
Representative Test P/N : EUB1312ME-07G8E (A BOM)			<b>Current Test Status</b>		<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) <b>0.25Max.</b>	Final Test Current Spec. (A) <b>0.25Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>1980-2420</b>	Final Test Speed Spec. (RPM) <b>1980-2420</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>35.5 Max</b>	Final Test Noise Spec. (dB A) <b>35.5 Max</b>	Deviation <b>3 dBMax.</b>
1	0.144	0.148	2.8	2199	2166	-1.5	32.0	32.2	0.2
2	0.144	0.148	2.8	2173	2176	0.1	31.3	31.9	0.6
3	0.146	0.151	3.4	2210	2158	-2.4	31.7	31.8	0.1
4	0.150	0.155	3.3	2200	2175	-1.1	31.6	32.1	0.5
5	0.143	0.148	3.5	2210	2178	-1.4	31.4	32.6	1.2
6	0.139	0.149	7.2	2215	2161	-2.4	31.9	31.4	-0.5
7	0.146	0.152	4.1	2224	2152	-3.2	31.3	31.5	0.2
8	0.140	0.151	7.9	2227	2154	-3.3	31.8	31.9	0.1
9	0.143	0.149	4.2	2196	2164	-1.5	31.5	32.0	0.5
10	0.143	0.155	8.4	2206	2175	-1.4	31.6	31.4	-0.2
11	0.142	0.151	6.3	2220	2157	-2.8	31.5	31.8	0.3
12	0.142	0.149	4.9	2208	2164	-2.0	31.8	31.7	-0.1
13	0.140	0.149	6.4	2182	2159	-1.1	31.1	31.3	0.2
14	0.147	0.149	1.4	2215	2184	-1.4	31.7	31.6	-0.1
15	0.146	0.155	6.2	2205	2174	-1.4	31.5	31.0	-0.5
16	0.141	0.150	6.4	2226	2160	-3.0	31.6	32.3	0.7
17	0.146	0.150	2.7	2194	2157	-1.7	31.8	31.4	-0.4
18	0.143	0.149	4.2	2206	2165	-1.9	31.3	32.3	1.0
19	0.143	0.150	4.9	2180	2158	-1.0	31.4	31.5	0.1
20	0.147	0.155	5.4	2221	2172	-2.2	31.2	32.3	1.1
21	0.143	0.149	4.2	2220	2160	-2.7	31.6	31.8	0.2
22	0.146	0.155	6.2	2217	2176	-1.8	31.3	31.3	0.0
23	0.141	0.148	5.0	2224	2164	-2.7	32.1	31.9	-0.2
24	0.140	0.155	10.7	2211	2174	-1.7	32.0	31.6	-0.4
25	0.148	0.149	0.7	2243	2164	-3.5	31.6	31.5	-0.1
26	0.145	0.154	6.2	2218	2177	-1.8	31.5	31.6	0.1
27	0.144	0.150	4.2	2225	2155	-3.1	31.9	31.6	-0.3
28	0.144	0.151	4.9	2230	2154	-3.4	31.6	31.9	0.3
29	0.144	0.150	4.2	2229	2161	-3.1	31.8	31.9	0.1
30	0.146	0.155	6.2	2220	2174	-2.1	31.7	31.0	-0.7
31	0.144	0.154	6.9	2235	2175	-2.7	31.4	31.2	-0.2
32	0.146	0.154	5.5	2210	2176	-1.5	32.2	32.3	0.1
<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>	
DG20FNL044	2155.00			2021/3/30		Poppy.Liang		Tim.Yi	



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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)
2,525	2020/6/26 9:00 AM	2020/11/11 12:07 AM	55	0	<b>4484.0</b>

Representative Test P/N : EUB1312ME-07G8E (A BOM)	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
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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
	<b>0.25Max.</b>	<b>0.25Max.</b>		<b>1980-2420</b>	<b>1980-2420</b>		<b>35.5 Max</b>	<b>35.5 Max</b>	
33	0.138	0.149	8.0	2212	2163	-2.2	31.5	31.8	0.3
34	0.148	0.154	4.1	2222	2175	-2.1	31.3	31.7	0.4
35	0.141	0.154	9.2	2244	2177	-3.0	31.6	31.3	-0.3
36	0.148	0.156	5.4	2266	2171	-4.2	31.9	31.7	-0.2
37	0.146	0.154	5.5	2223	2177	-2.1	32.1	31.8	-0.3
38	0.147	0.155	5.4	2225	2174	-2.3	31.8	31.9	0.1
39	0.145	0.148	2.1	2249	2183	-2.9	31.9	32.1	0.2
40	0.149	0.155	4.0	2241	2174	-3.0	31.6	32.0	0.4
41	0.143	0.151	5.6	2227	2154	-3.3	31.4	31.0	-0.4
42	0.146	0.155	6.2	2229	2175	-2.4	31.8	31.6	-0.2
43	0.152	0.155	2.0	2245	2176	-3.1	31.7	31.2	-0.5
44	0.141	0.155	9.9	2215	2173	-1.9	31.3	31.5	0.2
45	0.155	0.155	0.0	2232	2174	-2.6	31.6	31.7	0.1
46	0.144	0.150	4.2	2206	2158	-2.2	31.7	31.8	0.1
47	0.141	0.149	5.7	2226	2161	-2.9	31.6	31.6	0.0
48	0.141	0.150	6.4	2219	2158	-2.7	31.8	31.3	-0.5
49	0.143	0.154	7.7	2233	2177	-2.5	31.9	31.6	-0.3
50	0.147	0.155	5.4	2221	2175	-2.1	31.9	31.5	-0.4
51	0.142	0.155	9.2	2239	2176	-2.8	32.0	31.7	-0.3
52	0.146	0.155	6.2	2199	2175	-1.1	31.3	31.5	0.2
53	0.144	0.155	7.6	2214	2175	-1.8	30.9	31.8	0.9
54	0.144	0.155	7.6	2205	2172	-1.5	31.5	32.0	0.5
55	0.146	0.155	6.2	2220	2174	-2.1	31.8	32.0	0.2
X-Bar	0.14	0.15	-	2218.38	2168.47	-	31.63	31.70	-
$\sigma$	0.00	0.00	-	17.11	8.69	-	0.27	0.35	-

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DG20FNL044	2155.00	2021/3/30	Poppy.Liang	Tim.Yi