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 **AUB 80x80x20.0 mm** series as the right table	AUB0812HHDXHN				
Representative Test P/N : AUB0812HHD-BK22					
Equipment: 1.Oven: E24-F0059					

◎ **L_{10} Expectancy: 50,000 hours minimum @ fan rated voltage and the temperature of 40℃**

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,

$$t = 1.036 \times MTTF \times [(B_{r;c}) \div n]^{0.91} \div A_F \text{, and } A_F = 2^{(Ts-Tu)/10}$$

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 Ts (℃) (Actual Test Temperature)	Unstress Temperature Tu (℃)	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 ℃ (hours)	Verified L_{10} 40 ℃ (hours)
60	40	4.00	56	2.303	4,968	14,360.0	1,011,622	144,517

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2014/2/5 8:00 AM	2015/12/15 4:15 PM	☐ In process	☐ In process (exceed requested)	☑ Termination	14360.0

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_{10} 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 (℃)	Acceleration Factor A_F	Estimated MTTF (hours)	Estimated L_{10} (hours)
25	11.31	2,861,299	408,757
30	8.00	2,023,244	289,035
40	4.00	1,011,622	144,517
45	2.83	715,325	102,189
50	2.00	505,811	72,259
55	1.41	357,662	51,095
60	1.00	252,906	36,129

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 Result	☑ Accept ☐ Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG14FNL008	11312.00	2017/1/10	Dongqian.Liang	Tim.Yi

BGN（dBA）: 16.0 Temp（℃）: 24.1

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)	
4,968	2014/2/5 8:00 AM	2015/12/15 4:15 PM	56	0	**14360.0**	
Representative Test P/N : AUB0812HHD-BK22		**Current Test Status**		☐ In process	☐ In process (exceed requested)	☑ Termination
Equipment: 1.Oven: E24-F0059						

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) **0.40 Max.**	Final Test Current Spec. (A) **0.40 Max.**	Deviation (%)	Initial Test Speed Spec. (RPM) **4050-4950**	Final Test Speed Spec. (RPM) **4050-4950**	Deviation (%)	Initial Test Noise Spec. (dB A) **47.0 Max**	Final Test Noise Spec. (dB A) **47.0 Max**	Deviation **3 dBMax.**
1	0. 218	0. 212	-2.8	4397	4440	1.0	41.4	40.2	-1.2
2	0. 219	0. 219	0.0	4347	4387	0.9	41.5	40.3	-1.2
3	0. 222	0. 210	-5.4	4360	4484	2.8	42.4	40.8	-1.6
4	0. 226	0. 224	-0.9	4382	4273	-2.5	41.9	40.2	-1.7
5	0. 216	0. 210	-2.8	4322	4258	-1.5	42.2	39.8	-2.4
6	0. 231	0. 222	-3.9	4464	4493	0.6	42.7	40.5	-2.2
7	0. 222	0. 211	-5.0	4435	4528	2.1	42.5	41.2	-1.3
8	0. 227	0. 205	-9.7	4320	4539	5.1	41.4	41.0	-0.4
9	0. 215	0. 221	2.8	4445	4348	-2.2	41.6	40.0	-1.6
10	0. 235	0. 246	4.7	4561	4452	-2.4	41.8	40.2	-1.6
11	0. 222	0. 206	-7.2	4313	4421	2.5	42.0	40.6	-1.4
12	0. 220	0. 209	-5.0	4410	4525	2.6	42.2	40.7	-1.5
13	0. 216	0. 220	1.9	4546	4443	-2.3	42.4	40.8	-1.6
14	0. 224	0. 220	-1.8	4416	4419	0.1	42.6	41.5	-1.1
15	0. 217	0. 209	-3.7	4419	4360	-1.3	41.4	41.2	-0.2
16	0. 213	0. 216	1.4	4435	4429	-0.1	41.6	40.7	-0.9
17	0. 214	0. 212	-0.9	4432	4466	0.8	41.8	40.0	-1.8
18	0. 219	0. 222	1.4	4385	4356	-0.7	42.0	40.3	-1.7
19	0. 218	0. 210	-3.7	4515	4514	0.0	42.2	40.0	-2.2
20	0. 223	0. 217	-2.7	4380	4516	3.1	42.4	40.7	-1.7
21	0. 224	0. 222	-0.9	4599	4551	-1.0	42.6	40.6	-2.0
22	0. 224	0. 212	-5.4	4378	4497	2.7	41.5	41.3	-0.2
23	0. 232	0. 218	-6.0	4649	4500	-3.2	41.7	41.0	-0.7
24	0. 220	0. 232	5.5	4492	4602	2.4	41.8	41.4	-0.4
25	0. 213	0. 211	-0.9	4465	4399	-1.5	42.0	40.0	-2.0
26	0. 213	0. 210	-1.4	4403	4511	2.5	42.2	41.1	-1.1
27	0. 216	0. 207	-4.2	4403	4484	1.8	42.4	41.2	-1.2
28	0. 234	0. 231	-1.3	4431	4455	0.5	42.6	40.8	-1.8
29	0. 223	0. 224	0.4	4394	4273	-2.8	41.6	40.3	-1.3
30	0. 224	0. 212	-5.4	4289	4343	1.3	41.8	40.3	-1.5
31	0. 213	0. 212	-0.5	4466	4478	0.3	42.0	40.6	-1.4
32	0. 218	0. 211	-3.2	4464	4531	1.5	41.7	40.2	-1.5

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG14FNL008	**11312.00**	**2017/1/10**	**Dongqian.Liang**	**Tim.Yi**

DC FAN FUNCTION TEST RECORD
FOR LIFE EXPERIMENT

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 AUB 80x80x20.0 mm series as the right table	AUB0812HHDXHN				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)	
4,968	2014/2/5 8:00 AM	2015/12/15 4:15 PM	56	0	**14360.0**	
Representative Test P/N : AUB0812HHD-BK22		**Current Test Status**		☐ In process	☐ In process (exceed requested)	☑ Termination
Equipment: 1.Oven: E24-F0059						

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) **0.40 Max.**	Final Test Current Spec. (A) **0.40 Max.**	Deviation (%)	Initial Test Speed Spec. (RPM) **4050-4950**	Final Test Speed Spec. (RPM) **4050-4950**	Deviation (%)	Initial Test Noise Spec. (dB A) **47.0 Max**	Final Test Noise Spec. (dB A) **47.0 Max**	Deviation **3 dBMax.**
33	0. 220	0. 212	-3.6	4393	4481	2.0	42.1	41.6	-0.5
34	0. 224	0. 209	-6.7	4427	4414	-0.3	42.3	40.3	-2.0
35	0. 219	0. 210	-4.1	4441	4514	1.6	42.6	41.3	-1.3
36	0. 212	0. 215	1.4	4497	4451	-1.0	41.5	40.0	-1.5
37	0. 227	0. 221	-2.6	4419	4466	1.1	41.7	40.5	-1.2
38	0. 220	0. 202	-8.2	4399	4578	4.1	41.9	40.8	-1.1
39	0. 223	0. 224	0.4	4439	4425	-0.3	42.1	40.1	-2.0
40	0. 220	0. 214	-2.7	4492	4540	1.1	42.3	41.6	-0.7
41	0. 219	0. 240	9.6	4485	4213	-6.1	42.5	40.9	-1.6
42	0. 205	0. 203	-1.0	4444	4462	0.4	42.7	40.8	-1.9
43	0. 214	0. 206	-3.7	4378	4461	1.9	41.5	40.1	-1.4
44	0. 231	0. 223	-3.5	4372	4401	0.7	41.7	41.1	-0.6
45	0. 223	0. 228	2.2	4472	4417	-1.2	41.9	40.8	-1.1
46	0. 215	0. 219	1.9	4420	4387	-0.7	42.1	41.2	-0.9
47	0. 209	0. 215	2.9	4480	4392	-2.0	42.3	40.6	-1.7
48	0. 227	0. 211	-7.0	4438	4565	2.9	42.5	40.8	-1.7
49	0. 217	0. 222	2.3	4533	4377	-3.4	42.7	40.5	-2.2
50	0. 222	0. 221	-0.5	4532	4536	0.1	41.6	40.9	-0.7
51	0. 220	0. 218	-0.9	4490	4522	0.7	41.4	41.5	0.1
52	0. 222	0. 209	-5.9	4392	4468	1.7	41.9	40.2	-1.7
53	0. 212	0. 219	3.3	4454	4523	1.5	42.1	39.5	-2.6
54	0. 223	0. 217	-2.7	4483	4442	-0.9	42.3	40.9	-1.4
55	0. 222	0. 217	-2.3	4540	4503	-0.8	42.5	40.3	-2.2
56	0. 227	0. 221	-2.6	4424	4536	2.5	42.7	41.1	-1.6
X-Bar	0.2	0.2	-	4438.6	4452.7	-	42.05	40.7	-
σ	0.006	0.009	-	69.895	82.519	-	0.407	0.498	-

QE File No.	Time-out for function test or others (hrs)	Issued Date	Reported By	Approved By
DG14FNL008	**11312.00**	**2017/1/10**	**Dongqian.Liang**	**Tim.Yi**