



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 AUC 60x60x15.0 mm series as the right table	AUB0612VHB-A				
	AUB0612HHB-A				
	AUB0612HB-A				
	AUB0612HHB-AX01				

Representative Test P/N : AUC0612DB-AF00

Equipment: 1.Oven: E24-F0052 On/Off Cycles: Every 500 hours

◎ **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)	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)
60	40	4.00	56	2.303	4,968	12,969.0	913,630	130,519

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2009/10/29 3:00 PM	2010/12/23 10:45 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	12969.0

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	11.31	2,584,136	369,162
30	8.00	1,827,260	261,037
40	4.00	913,630	130,519
50	2.00	456,815	65,259
60	1.00	228,407	32,630

- 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	<input checked="" type="checkbox"/> Accept
	<input type="checkbox"/> Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG09FNL151	5119.50	2011/11/26	Nan Yang	Tim Yi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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AUB0612VHB-A				
AUB0612HHB-A				
AUB0612HB-A				
AUB0612HHB-AX01				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
4,968	2009/10/29 3:00 PM	2010/12/23 10:45 PM	56	0	12969.0

Representative Test P/N : AUC0612DB-AF00	Current Test Status	<input type="checkbox"/>	In process	<input type="checkbox"/>	In process (exceed requested)	Termination
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Equipment: 1.Oven: E24-F0052 On/Off Cycles: Every 500 hours

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (mA) 450 Max.	Final Test Current Spec. (mA) 450 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5400-6600	Final Test Speed Spec. (RPM) 5400-6600	Deviation (%)	Initial Test Noise Spec. (dB A) 44.5 Max	Final Test Noise Spec. (dB A) 44.5 Max	Deviation 3 dBMax.
1	273	269	-1.5	5877	5983	1.8	39.9	40.2	0.3
2	264	252	-4.5	5833	5966	2.3	40.3	40.0	-0.3
3	283	273	-3.5	5859	6064	3.5	40.5	40.5	0.0
4	262	260	-0.8	5907	5912	0.1	39.7	40.4	0.7
5	270	253	-6.3	5749	5803	0.9	40.2	40.1	-0.1
6	269	264	-1.9	5802	5867	1.1	39.9	40.3	0.4
7	276	252	-8.7	5820	6147	5.6	40.5	40.2	-0.3
8	270	261	-3.3	5903	6020	2.0	40.3	40.4	0.1
9	265	257	-3.0	5836	5906	1.2	40.1	40.1	0.0
10	267	259	-3.0	5768	5885	2.0	40.4	40.3	-0.1
11	260	251	-3.5	5894	6029	2.3	39.8	40.5	0.7
12	281	270	-3.9	6020	6094	1.2	40.0	40.1	0.1
13	281	275	-2.1	5921	5997	1.3	40.3	40.3	0.0
14	274	270	-1.5	5902	5886	-0.3	39.9	40.2	0.3
15	285	277	-2.8	5934	6047	1.9	40.4	40.3	-0.1
16	276	263	-4.7	5852	6077	3.8	40.1	40.5	0.4
17	274	267	-2.6	5817	5922	1.8	39.9	40.1	0.2
18	264	253	-4.2	5739	5996	4.5	39.1	40.3	1.2
19	274	273	-0.4	5864	5865	0.0	39.9	40.5	0.6
20	276	268	-2.9	5886	6019	2.3	39.8	40.3	0.5
21	270	258	-4.4	5847	6047	3.4	40.2	40.4	0.2
22	276	265	-4.0	5854	6060	3.5	40.0	40.1	0.1
23	270	260	-3.7	5894	6089	3.3	39.8	40.5	0.7
24	279	272	-2.5	5907	6059	2.6	40.6	40.3	-0.3
25	283	275	-2.8	5861	5984	2.1	40.4	40.2	-0.2
26	264	286	8.3	5844	5719	-2.1	39.9	40.5	0.6
27	284	268	-5.6	5854	5925	1.2	40.3	40.2	-0.1
28	272	267	-1.8	5979	6026	0.8	40.1	40.3	0.2
29	271	261	-3.7	5978	6129	2.5	40.2	40.3	0.1
30	291	275	-5.5	6016	6314	5.0	39.9	40.5	0.6
31	281	270	-3.9	5942	6135	3.2	40.7	40.4	-0.3
32	285	278	-2.5	5863	5979	2.0	39.8	40.2	0.4
33	284	272	-4.2	5851	6102	4.3	40.6	40.1	-0.5
34	273	259	-5.1	5792	6108	5.5	40.2	40.4	0.2
35	272	268	-1.5	5802	5701	-1.7	40.5	40.3	-0.2

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG09FNL151	5119.50	2011/11/26	Nan Yang	Tim Yi



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	2009/10/29 3:00 PM	2010/12/23 10:45 PM	56	0	12969.0
Representative Test P/N : AUC0612DB-AF00			Current Test Status	<input type="checkbox"/> In process <input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-F0052				On/Off Cycles: Every 500 hours	

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (mA) 450 Max.	Final Test Current Spec. (mA) 450 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5400-6600	Final Test Speed Spec. (RPM) 5400-6600	Deviation (%)	Initial Test Noise Spec. (dB A) 44.5 Max	Final Test Noise Spec. (dB A) 44.5 Max	Deviation 3 dBMax.
36	268	258	-3.7	5855	6028	3.0	40.3	40.5	0.2
37	278	273	-1.8	5795	5821	0.4	40.1	40.4	0.3
38	278	257	-7.6	5895	6253	6.1	40.4	40.3	-0.1
39	264	251	-4.9	5891	6107	3.7	39.9	40.2	0.3
40	283	283	0.0	5925	5877	-0.8	40.5	40.5	0.0
41	270	262	-3.0	5879	6050	2.9	40.2	40.1	-0.1
42	289	275	-4.8	5824	6051	3.9	40.6	40.4	-0.2
43	278	269	-3.2	5914	5979	1.1	40.4	40.5	0.1
44	268	275	2.6	5860	5608	-4.3	40.1	40.5	0.4
45	269	252	-6.3	5795	6006	3.6	39.9	40.3	0.4
46	274	249	-9.1	5745	6165	7.3	40.2	40.2	0.0
47	265	255	-3.8	5809	5967	2.7	39.8	40.5	0.7
48	275	266	-3.3	5874	6051	3.0	40.1	40.3	0.2
49	274	276	0.7	5846	5851	0.1	40.5	40.2	-0.3
50	262	255	-2.7	5875	5933	1.0	39.9	40.5	0.6
51	265	253	-4.5	5938	6053	1.9	40.4	40.2	-0.2
52	266	259	-2.6	5895	5956	1.0	40.2	40.3	0.1
53	263	260	-1.1	5884	5933	0.8	40.4	40.2	-0.2
54	266	258	-3.0	5940	6115	2.9	39.8	40.5	0.7
55	285	257	-9.8	5826	6096	4.6	40.3	40.3	0.0
56	271	274	1.1	5918	5830	-1.5	39.9	40.1	0.2
X-Bar	273.4	264.6	-	5868.8	5992.7	-	40.14	40.31	-
σ	7.617	9.105	-	61.477	129.005	-	0.298	0.144	-

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