



# 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 <b>AUB 92x92x25.4 mm</b> series as the right table	AUB0912VH-CR00			
	AUB0912VH-CF00			

**Representative Test P/N : AUB0912VH-CF00**

**Equipment: 1.Oven: E24-F0053** On/Off Cycles: Every 500 hours

© **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,

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

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 Ts (°C)	Unstress Temperature Tu (°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)
60	40	4.00	56	2.303	4,968	4,360.0	307,150	43,879

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2008/8/6 2:30 PM	2009/4/10 4:15 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	4360.0

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<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	11.31	868,751	124,107
30	8.00	614,300	87,757
40	4.00	307,150	43,879
50	2.00	153,575	21,939
60	1.00	76,787	10,970

- Fan permission criteria for the measurement after test :
- Speed can not drop of  $\geq 15\%$  below the original measured rpm.
  - Current cannot increase  $> 15\%$  of original measure current.
  - Noise cannot  $> 3\text{dB}$  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
DG08FNL128	961.50	2009/3/19	Nan Yang	Zenny Lei



# 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 92x92x25.4 mm series as the right table

AUB0912VH-CR00				
AUB0912VH-CF00				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
4,968	2008/8/6 2:30 PM	2009/4/10 4:15 PM	56	0	<b>4360.0</b>

Representative Test P/N : AUB0912VH-CF00	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
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Equipment: 1.Oven: E24-F0053 On/Off Cycles: Every 500 hours

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation
	Current Spec. (mA) <b>600 Max.</b>	Current Spec. (mA) <b>600 Max.</b>		Speed Spec. (RPM) <b>3312-3888</b>	Speed Spec. (RPM) <b>3312-3888</b>		Noise Spec. (dB A) <b>49.0 Max</b>	Noise Spec. (dB A) <b>49.0 Max</b>	
1	405	418	3.2	3688	3655	-0.9	46.8	46.3	-0.5
2	403	428	6.2	3711	3614	-2.6	46.2	46.1	-0.1
3	405	410	1.2	3687	3673	-0.4	46.7	46.3	-0.4
4	417	448	7.4	3763	3682	-2.2	46.4	46.9	0.5
5	402	393	-2.2	3686	3783	2.6	46.6	46.5	-0.1
6	399	433	8.5	3731	3663	-1.8	46.1	45.8	-0.3
7	405	416	2.7	3650	3685	1.0	46.3	46.1	-0.2
8	409	418	2.2	3677	3700	0.6	46.9	45.7	-1.2
9	411	437	6.3	3722	3656	-1.8	46.7	46.3	-0.4
10	423	445	5.2	3736	3692	-1.2	46.5	46.0	-0.5
11	426	441	3.5	3757	3732	-0.7	45.7	46.5	0.8
12	413	404	-2.2	3668	3797	3.5	46.5	46.3	-0.2
13	401	418	4.2	3684	3624	-1.6	46.3	45.9	-0.4
14	410	431	5.1	3700	3631	-1.9	45.7	46.2	0.5
15	400	423	5.8	3693	3632	-1.7	46.5	46.6	0.1
16	413	429	3.9	3689	3700	0.3	46.9	46.3	-0.6
17	405	425	4.9	3703	3653	-1.4	46.1	46.1	0.0
18	414	432	4.3	3696	3618	-2.1	46.4	45.7	-0.7
19	396	429	8.3	3678	3653	-0.7	46.2	46.0	-0.2
20	400	402	0.5	3731	3761	0.8	46.9	46.2	-0.7
21	404	427	5.7	3693	3655	-1.0	46.4	45.9	-0.5
22	404	417	3.2	3657	3672	0.4	46.9	46.1	-0.8
23	408	433	6.1	3724	3613	-3.0	46.7	45.7	-1.0
24	411	441	7.3	3717	3646	-1.9	46.2	46.0	-0.2
25	392	409	4.3	3570	3682	3.1	46.5	45.8	-0.7
26	416	414	-0.5	3709	3767	1.6	46.8	46.3	-0.5
27	414	427	3.1	3722	3695	-0.7	46.1	46.0	-0.1
28	406	429	5.7	3690	3745	1.5	46.3	46.4	0.1
29	413	406	-1.7	3682	3745	1.7	46.5	46.4	-0.1
30	404	431	6.7	3683	3694	0.3	46.8	46.0	-0.8
31	412	420	1.9	3710	3701	-0.2	46.3	45.8	-0.5
32	402	411	2.2	3624	3417	-5.7	46.3	46.2	-0.1
33	410	424	3.4	3775	3678	-2.6	46.7	45.9	-0.8
34	410	448	9.3	3730	3657	-2.0	46.3	45.9	-0.4
35	419	406	-3.1	3734	3756	0.6	46.5	46.3	-0.2

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
<b>DG08FNL128</b>	<b>961.50</b>	<b>2009/3/19</b>	<b>Nan Yang</b>	<b>Zenny Lei</b>



# DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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AUB0912VH-CF00				

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4,968	2008/8/6 2:30 PM	2009/4/10 4:15 PM	56	0	<b>4360.0</b>

Representative Test P/N : AUB0912VH-CF00	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
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### Test Data Between Initial Test and Final Test

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation
	Current Spec. (mA)	Current Spec. (mA)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	600 Max.	600 Max.		3312-3888	3312-3888		49.0 Max	49.0 Max	3 dBMax.
36	411	423	2.9	3699	3749	1.4	46.0	45.7	-0.3
37	412	419	1.7	3658	3722	1.7	46.9	46.1	-0.8
38	410	417	1.7	3702	3677	-0.7	46.7	45.7	-1.0
39	417	409	-1.9	3674	3756	2.2	46.3	46.0	-0.3
40	421	412	-2.1	3728	3734	0.2	46.9	45.9	-1.0
41	410	416	1.5	3729	3627	-2.7	46.2	46.2	0.0
42	406	422	3.9	3739	3718	-0.6	46.5	45.8	-0.7
43	406	400	-1.5	3731	3798	1.8	46.7	46.1	-0.6
44	413	418	1.2	3754	3725	-0.8	46.1	46.4	0.3
45	400	438	9.5	3678	3660	-0.5	46.5	46.0	-0.5
46	426	405	-4.9	3741	3738	-0.1	46.9	46.5	-0.4
47	414	451	8.9	3715	3664	-1.4	46.3	45.8	-0.5
48	405	420	3.7	3728	3751	0.6	45.5	46.1	0.6
49	393	413	5.1	3617	3701	2.3	46.7	45.7	-1.0
50	396	426	7.6	3693	3644	-1.3	46.2	46.0	-0.2
51	411	433	5.4	3716	3673	-1.2	46.5	45.8	-0.7
52	405	422	4.2	3706	3674	-0.9	46.0	46.2	0.2
53	397	419	5.5	3723	3691	-0.9	46.7	45.7	-1.0
54	405	396	-2.2	3668	3724	1.5	46.2	46.1	-0.1
55	409	410	0.2	3719	3747	0.8	46.5	46.3	-0.2
56	396	422	6.6	3690	3618	-2.0	46.8	45.9	-0.9
X-Bar	407.9	421.7	-	3701.4	3687.8	-	46.44	46.08	-
$\sigma$	7.702	13.169	-	36.385	61.133	-	0.329	0.269	-

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DG08FNL128	961.50	2009/3/19	Nan Yang	Zenny Lei