



# DC FAN LIFE EXPERIMENT REPORT

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 AUB92x92x25.4 mm series as the right table	AUB0912VH-DR00			
	AUB0912VH-CF00			
	AUB0912VH-CX09			

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

**Equipment: 1.Oven: E24-F0031** 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,

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

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 Ts (°C) (Actual Test Temperature)	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)
70	40	8.00	56	2.303	2,484	2,485.0	350,123	50,018

### Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2006/2/13 10:30 PM	2006/7/11 9:37 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	2485.0

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	22.63	990,296	141,471
30	16.00	700,245	100,035
40	8.00	350,123	50,018
50	4.00	175,061	25,009
60	2.00	87,531	12,504
70	1.00	43,765	6,252

Fan permission criteria for the measurement after test :

1. For current, the limit is less than spec.(max.).
2. For speed, the allowable decrease is less than 15%.
3. For noise, the limit is less than spec.(max.). + 3 dB

<b>Test Result</b>	<input checked="" type="checkbox"/> <b>Accept</b>
	<input type="checkbox"/> <b>Reject</b>

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG06FNL041	1067.00	2006/7/11 10:30 PM	Nan.Yang	Gx.Xu



# DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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AUB0912VH-DR00			
AUB0912VH-CF00			
AUB0912VH-CX09			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
2,484	2006/2/13 10:30 PM	2006/7/11 9:37 PM	56	0	<b>2485.0</b>

Representative Test P/N : AUB0912VH-CF00	Current Test Status	<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-F0031 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. (A) <b>0.48Max.</b>	Current Spec. (A) <b>0.48Max.</b>		Speed Spec. (RPM) <b>3312-3888</b>	Speed Spec. (RPM) <b>3312-3888</b>		Noise Spec. (dB A) <b>50.0Max</b>	Noise Spec. (dB A) <b>50.0Max</b>	
1	0.42	0.40	-4.8	3742	3738	-0.1	46.7	46.4	-0.6
2	0.40	0.39	-2.5	3684	3653	-0.8	46.5	46.8	0.6
3	0.42	0.40	-4.8	3715	3763	1.3	46.8	46.3	-1.1
4	0.41	0.38	-7.3	3664	3670	0.2	47.0	46.6	-0.9
5	0.42	0.41	-2.4	3728	3745	0.5	46.6	46.4	-0.4
6	0.39	0.38	-2.6	3720	3747	0.7	47.1	46.7	-0.8
7	0.40	0.40	0.0	3743	3737	-0.2	46.5	46.3	-0.4
8	0.40	0.40	0.0	3708	3796	2.4	46.8	46.6	-0.4
9	0.38	0.39	2.6	3651	3648	-0.1	46.7	46.5	-0.4
10	0.40	0.40	0.0	3784	3753	-0.8	47.1	46.7	-0.8
11	0.41	0.41	0.0	3694	3731	1.0	46.7	46.3	-0.9
12	0.42	0.40	-4.8	3703	3713	0.3	46.5	46.4	-0.2
13	0.41	0.40	-2.4	3767	3755	-0.3	46.7	46.6	-0.2
14	0.39	0.40	2.6	3746	3732	-0.4	46.5	46.3	-0.4
15	0.41	0.40	-2.4	3726	3721	-0.1	46.9	46.6	-0.6
16	0.39	0.39	0.0	3713	3658	-1.5	46.7	46.9	0.4
17	0.41	0.40	-2.4	3731	3712	-0.5	46.6	47.1	1.1
18	0.39	0.41	5.1	3750	3705	-1.2	47.1	46.7	-0.8
19	0.40	0.40	0.0	3724	3692	-0.9	46.8	46.4	-0.9
20	0.41	0.39	-4.9	3700	3734	0.9	47.0	46.8	-0.4
21	0.39	0.39	0.0	3677	3674	-0.1	46.7	46.5	-0.4
22	0.40	0.40	0.0	3665	3747	2.2	47.1	46.7	-0.8
23	0.41	0.41	0.0	3724	3783	1.6	46.9	46.4	-1.1
24	0.41	0.41	0.0	3650	3741	2.5	46.5	46.6	0.2
25	0.39	0.40	2.6	3716	3748	0.9	46.7	46.8	0.2
26	0.40	0.41	2.5	3752	3746	-0.2	47.2	46.5	-1.5
27	0.40	0.39	-2.5	3764	3760	-0.1	46.7	46.7	0.0
28	0.38	0.38	0.0	3642	3690	1.3	46.9	46.4	-1.1
29	0.41	0.42	2.4	3716	3741	0.7	46.5	46.7	0.4
30	0.41	0.38	-7.3	3646	3763	3.2	47.1	46.5	-1.3
31	0.40	0.40	0.0	3702	3723	0.6	46.6	46.8	0.4
32	0.39	0.38	-2.6	3673	3686	0.4	46.8	47.0	0.4
33	0.40	0.39	-2.5	3677	3712	1.0	47.0	46.5	-1.1
34	0.40	0.40	0.0	3699	3826	3.4	46.7	46.7	0.0
35	0.40	0.39	-2.5	3627	3679	1.4	47.1	46.7	-0.8

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
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2,484	2006/2/13 10:30 PM	2006/7/11 9:37 PM	56	0	<b>2485.0</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-F0031 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. (A)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	<b>0.48Max.</b>	<b>0.48Max.</b>		<b>3312-3888</b>	<b>3312-3888</b>		<b>50.0Max</b>	<b>50.0Max</b>	
36	0.39	0.39	0.0	3646	3669	0.6	46.9	47.1	0.4
37	0.39	0.39	0.0	3729	3786	1.5	46.5	46.4	-0.2
38	0.39	0.38	-2.6	3707	3764	1.5	46.7	46.8	0.2
39	0.38	0.37	-2.6	3590	3640	1.4	46.6	46.6	0.0
40	0.40	0.39	-2.5	3728	3721	-0.2	47.1	46.4	-1.5
41	0.41	0.38	-7.3	3656	3730	2.0	46.9	47.0	0.2
42	0.39	0.40	2.6	3764	3708	-1.5	47.0	46.5	-1.1
43	0.39	0.39	0.0	3788	3797	0.2	46.8	46.7	-0.2
44	0.40	0.42	5.0	3730	3776	1.2	46.5	47.2	1.5
45	0.39	0.41	5.1	3718	3779	1.6	46.7	46.5	-0.4
46	0.39	0.40	2.6	3702	3724	0.6	47.0	46.4	-1.3
47	0.40	0.40	0.0	3668	3702	0.9	46.8	46.7	-0.2
48	0.38	0.39	2.6	3632	3669	1.0	46.7	46.3	-0.9
49	0.38	0.39	2.6	3735	3737	0.1	47.1	47.1	0.0
50	0.39	0.40	2.6	3641	3706	1.8	46.0	46.6	1.3
51	0.39	0.36	-7.7	3783	3789	0.2	46.8	46.3	-1.1
52	0.39	0.39	0.0	3637	3748	3.1	46.6	46.9	0.6
53	0.39	0.39	0.0	3719	3659	-1.6	46.9	46.6	-0.6
54	0.39	0.39	0.0	3732	3716	-0.4	47.0	46.3	-1.5
55	0.41	0.41	0.0	3735	3725	-0.3	46.6	47.0	0.9
56	0.40	0.41	2.5	3690	3758	1.8	46.7	46.7	0.0
X-Bar	0.398	0.396	-	3702.2	3727.2	-	46.78	46.63	-
$\sigma$	0.011	0.012	-	44.058	41.885	-	0.229	0.238	-

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DG06FNL041	1067.00	2006/7/11 10:30 PM	Nan.Yang	Gx.Xu