



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 70x70x15.0 mm series as the right table				
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Representative Test P/N : AUB0712MB-AL3G	
Equipment: 1.Oven: E24-F0056	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 Ts (°C) (Actual Test Temperature)	Unstress Temperature Tu (°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	18,969.0	1,336,313	190,902

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2011/5/25 10:00 AM	2012/3/18 12:45 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	18969.0

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	3,779,665	539,952
30	8.00	2,672,627	381,804
40	4.00	1,336,313	190,902
50	2.00	668,157	95,451
60	1.00	334,078	47,725

- 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	<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
DG11FNL060	9887.00	2014/9/22	Loly.Wang	Tim.Yi

BGN (dBA) :16.2

Temp (°C) : 24.6



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	2011/5/25 10:00 AM	2012/3/18 12:45 AM	56	0	18969.0					
Representative Test P/N : AUB0712MB-AL3G			Current Test Status		<input type="checkbox"/> In process		<input type="checkbox"/> In process (exceed requested)		<input checked="" type="checkbox"/> Termination	
Equipment: 1.Oven: E24-F0056						On/Off Cycles: Every 500 hours				
Test Data Between Initial Test and Final Test										
Sample No.	Initial Test Current Spec. (mA) 240 Max.	Final Test Current Spec. (mA) 240 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 3060-3740	Final Test Speed Spec. (RPM) 3060-3740	Deviation (%)	Initial Test Noise Spec. (dB A) 33.6 Max	Final Test Noise Spec. (dB A) 33.6 Max	Deviation 3 dBMax.	
1	92	97	5.4	3524	3435	-2.5	29.0	28.8	-0.2	
2	93	92	-1.1	3414	3491	2.3	28.5	29.0	0.5	
3	95	91	-4.2	3514	3496	-0.5	29.3	29.2	-0.1	
4	96	96	0.0	3493	3476	-0.5	28.7	28.6	-0.1	
5	95	89	-6.3	3514	3527	0.4	29.5	29.0	-0.5	
6	91	95	4.4	3510	3506	-0.1	28.9	28.5	-0.4	
7	93	97	4.3	3475	3483	0.2	28.5	28.6	0.1	
8	92	91	-1.1	3490	3399	-2.6	29.3	29.1	-0.2	
9	93	101	8.6	3555	3276	-7.8	29.2	28.8	-0.4	
10	94	98	4.3	3507	3431	-2.2	29.5	28.3	-1.2	
11	91	99	8.8	3506	3394	-3.2	28.7	28.6	-0.1	
12	95	93	-2.1	3518	3442	-2.2	28.9	29.0	0.1	
13	93	95	2.2	3536	3432	-2.9	29.2	28.5	-0.7	
14	92	90	-2.2	3427	3376	-1.5	29.5	29.1	-0.4	
15	92	91	-1.1	3541	3393	-4.2	29.7	28.6	-1.1	
16	92	96	4.3	3518	3345	-4.9	28.7	28.4	-0.3	
17	91	100	9.9	3517	3395	-3.5	29.2	28.9	-0.3	
18	92	89	-3.3	3499	3479	-0.6	29.3	29.3	0.0	
19	95	94	-1.1	3498	3467	-0.9	29.5	28.5	-1.0	
20	95	90	-5.3	3543	3478	-1.8	28.7	28.8	0.1	
21	93	98	5.4	3512	3479	-0.9	29.5	28.7	-0.8	
22	95	90	-5.3	3456	3489	1.0	29.2	29.0	-0.2	
23	95	96	1.1	3479	3419	-1.7	28.9	28.7	-0.2	
24	93	96	3.2	3502	3478	-0.7	28.7	29.0	0.3	
25	94	95	1.1	3508	3359	-4.2	29.2	28.5	-0.7	
26	92	95	3.3	3513	3378	-3.8	29.0	29.2	0.2	
27	94	94	0.0	3504	3353	-4.3	29.2	28.7	-0.5	
28	93	94	1.1	3466	3362	-3.0	29.0	29.1	0.1	
29	93	89	-4.3	3526	3443	-2.4	28.7	28.6	-0.1	
30	93	99	6.5	3501	3390	-3.2	29.0	28.9	-0.1	
31	91	90	-1.1	3519	3473	-1.3	28.7	28.7	0.0	
32	92	93	1.1	3502	3442	-1.7	28.9	29.1	0.2	
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By			
DG11FNL060	9887.00		2014/9/22		Loly.Wang		Tim.Yi			



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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33	93	95	2.2	3508	3458	-1.4	29.2	29.2	0.0
34	93	91	-2.2	3516	3427	-2.5	29.0	28.6	-0.4
35	96	89	-7.3	3492	3513	0.6	28.9	28.4	-0.5
36	91	91	0.0	3498	3443	-1.6	29.0	29.2	0.2
37	93	94	1.1	3527	3457	-2.0	28.2	28.9	0.7
38	94	93	-1.1	3514	3423	-2.6	29.0	29.3	0.3
39	97	101	4.1	3421	3285	-4.0	29.2	28.5	-0.7
40	95	93	-2.1	3458	3392	-1.9	29.0	29.1	0.1
41	94	91	-3.2	3407	3518	3.3	28.7	28.7	0.0
42	94	98	4.3	3431	3418	-0.4	29.0	28.4	-0.6
43	93	93	0.0	3434	3480	1.3	29.1	28.9	-0.2
44	97	95	-2.1	3401	3362	-1.1	28.7	28.5	-0.2
45	97	101	4.1	3389	3130	-7.6	28.5	29.1	0.6
46	92	94	2.2	3453	3338	-3.3	29.2	28.7	-0.5
47	94	94	0.0	3405	3370	-1.0	29.0	28.3	-0.7
48	93	96	3.2	3472	3391	-2.3	28.7	29.0	0.3
49	94	93	-1.1	3419	3413	-0.2	29.0	28.4	-0.6
50	98	91	-7.1	3374	3478	3.1	29.2	28.9	-0.3
51	96	97	1.0	3416	3371	-1.3	29.3	29.2	-0.1
52	95	90	-5.3	3442	3481	1.1	29.5	28.5	-1.0
53	99	96	-3.0	3344	3405	1.8	29.4	28.7	-0.7
54	95	91	-4.2	3365	3492	3.8	29.5	29.1	-0.4
55	92	95	3.3	3442	3458	0.5	29.0	28.6	-0.4
56	94	91	-3.2	3353	3427	2.2	29.2	28.8	-0.4
X-Bar	93.7	94.0	-	3474.4	3423.5	-	29.04	28.80	-
σ	1.834	3.330	-	52.814	69.384	-	0.315	0.281	-
QE File No.	Time-out for function test or others (hrs)		Issued Date		Reported By		Approved By		
DG11FNL060	9887.00		2014/9/22		Loly.Wang		TimYi		