



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 AUB50x50x15mm series as the right table	AUB0512LB-AYCX			

Representative Test P/N : AUB0512LB-BV37 (I:4020323800; F:4020323800)

Equipment: 1.Oven: E24-W571 Measure current, speed, noise every week.

⊙ **L₁₀ Expectancy: 60,000 hours minimum @ fan rated voltage and the temperature of 40°C**

According to the equation for **Weibull distribution**, **MTTF ≅ 7×L10 = 420,000 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%), and

Stress/Elevated Temperature T _s (°C) (Actual Test Temperature)	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	5,962	7,974.0	561,746	80,249

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2012/2/28 10:00 AM	2012/11/24 11:54 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	7974.0

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	1,588,858	226,980
30	8.00	1,123,492	160,499
40	4.00	561,746	80,249
50	2.00	280,873	40,125
60	1.00	140,437	20,062

Fan permission criteria for the measurement after test :

1. Speed can not drop of $\geq 15\%$ below the original measured rpm.
2. Current cannot increase $> 15\%$ of original measure current.
3. 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
WJQEFML-2012034VD	520.00	2013/2/16 8:00 AM	KALLI	TRACY.GONG



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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 AUB50x50x15mm series as the right table				AUB0512LB-AYCX					
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)				
5,962	2012/2/28 10:00 AM	2012/11/24 11:54 AM	56	0	7974.0				
Representative Test P/N : AUB0512LB-BV37			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination			
Equipment: 1.Oven: E24-W571				Measure current, speed, noise every week.					
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 Check. (dB A)	
	110MAX.	110MAX.	15% MAX.	4000REF	4000REF	15% MAX.	31.0MAX.	31.0MAX.	3 dB MAX.
1	56	54	-3.6	3883	3835	-1.2	26.1	27.9	1.8
2	56	54	-3.6	4060	3801	-6.4	28.6	27.5	-1.1
3	58	57	-1.7	3771	3766	-0.1	27.0	27.6	0.6
4	56	50	-10.7	3722	3802	2.1	26.8	28.1	1.3
5	56	57	1.8	4013	3750	-6.6	28.3	27.9	-0.4
6	57	56	-1.8	3917	3800	-3.0	27.8	28.2	0.4
7	55	55	0.0	4027	3731	-7.4	27.8	27.9	0.1
8	59	65	10.2	3712	3892	4.8	27.0	28.2	1.2
9	57	59	3.5	3863	3859	-0.1	28.7	27.0	-1.7
10	56	61	8.9	4026	3817	-5.2	28.6	27.2	-1.4
11	54	58	7.4	4159	3818	-8.2	26.9	27.8	0.9
12	57	59	3.5	3651	3803	4.2	26.7	27.0	0.3
13	52	58	11.5	3939	3797	-3.6	27.6	27.6	0.0
14	55	58	5.5	4185	3790	-9.4	28.8	27.3	-1.5
15	55	59	7.3	4097	3760	-8.2	29.0	27.5	-1.5
16	57	58	1.8	3833	3806	-0.7	28.9	26.9	-2.0
17	58	60	3.4	3815	3796	-0.5	28.0	27.5	-0.5
18	56	62	10.7	3712	3746	0.9	26.8	27.6	0.8
19	55	59	7.3	4128	3800	-7.9	29.0	27.9	-1.1
20	56	58	3.6	3887	3805	-2.1	28.0	27.2	-0.8
21	55	60	9.1	3664	3805	3.8	26.7	27.1	0.4
22	55	54	-1.8	3736	3860	3.3	26.6	27.6	1.0
23	58	54	-6.9	3790	3845	1.5	29.0	28.2	-0.8
24	57	57	0.0	3689	3848	4.3	26.6	27.9	1.3
25	59	55	-6.8	3665	3802	3.7	26.5	27.9	1.4
26	58	57	-1.7	3740	3750	0.3	27.3	27.6	0.3
27	55	56	1.8	4128	3805	-7.8	28.7	28.2	-0.5
28	57	55	-3.5	3867	3860	-0.2	28.3	28.4	0.1
29	56	55	-1.8	3983	3845	-3.5	28.2	28.6	0.4
30	57	58	1.8	3960	3848	-2.8	28.1	27.9	-0.2



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Representative Test P/N : AUB0512LB-BV37			Current Test Status		<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination		
Equipment: 1.Oven: E24-W571				Measure current, speed, noise every week.					
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 Check. (dB A)	
	110MAX.	110MAX.	15% MAX.	4000REF	4000REF	15% MAX.	31.0MAX.	31.0MAX.	3 dB MAX.
31	55	59	7.3	3933	3802	-3.3	27.8	27.9	0.1
32	58	57	-1.7	3834	3750	-2.2	27.8	27.6	-0.2
33	57	52	-8.8	3612	3800	5.2	27.6	27.9	0.3
34	56	57	1.8	3990	3731	-6.5	28.3	27.6	-0.7
35	55	56	1.8	4111	3892	-5.3	27.7	27.0	-0.7
36	57	55	-3.5	3787	3859	1.9	26.5	27.1	0.6
37	57	57	0.0	3939	3817	-3.1	28.6	26.5	-2.1
38	58	56	-3.4	3850	3796	-1.4	27.1	26.4	-0.7
39	57	55	-3.5	3829	3746	-2.2	27.5	27.9	0.4
40	57	55	-3.5	3925	3800	-3.2	26.8	27.9	1.1
41	58	59	1.7	3796	3805	0.2	27.6	27.9	0.3
42	57	61	7.0	3827	3805	-0.6	27.2	28.2	1.0
43	57	58	1.8	3814	3860	1.2	27.5	28.1	0.6
44	57	59	3.5	3935	3796	-3.5	27.8	29.2	1.4
45	57	58	1.8	3793	3746	-1.2	28.3	28.2	-0.1
46	53	58	9.4	4237	3800	-10.3	26.7	27.9	1.2
47	57	59	3.5	3893	3805	-2.3	27.2	27.9	0.7
48	57	58	1.8	3901	3805	-2.5	28.1	27.7	-0.4
49	56	60	7.1	3943	3860	-2.1	29.1	27.9	-1.2
50	58	62	6.9	3827	3845	0.5	26.7	28.5	1.8
51	56	59	5.4	3641	3796	4.3	26.5	27.1	0.6
52	57	59	3.5	3700	3746	1.2	26.6	27.2	0.6
53	58	61	5.2	3788	3800	0.3	28.7	28.1	-0.6
54	58	58	0.0	3835	3805	-0.8	27.3	28.2	0.9
55	58	59	1.7	3774	3805	0.8	27.7	26.6	-1.1
56	56	58	3.6	3666	3860	5.3	26.6	26.8	0.2
X-Bar	56.52	57.55	-	3871.46	3806.68	-	27.64	27.69	-
σ	1.375	2.593	-	151.285	39.104	-	0.833	0.547	-
QE File No.		Time-out for function test or others (hours)		Issued Date		Reported By		Approved By	
WJQEFML-2012034VD		520.00		2013/2/16 8:00 AM		KAILI		TRACY.GONG	