



# 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 ASB30x30x10mm series as the right table	ASB0312HA-BA51	ASB0305HA-D/-DF00/-DR00	
	ASB0305HA-C/-CA01	ASB0312LA-D/-DF00/-DR00	
	ASB0305LA-D/-DF00/-DR00	ASB0312MA-D/-DF00/-DR00	
	ASB0305MA-D/-DF00/-DR00	ASB0312HA-D/-DF00/-DR00	
<b>Representative Test P/N :ASB0312HA-C</b>			
<b>Equipment: 1.Oven: E24-W577</b>			

◎ **L<sub>10</sub> Expectancy:**                    **20,000** hours minimum @ fan rated voltage and the temperature of 40°C

According to the equation for **Weibull distribution**,                    **MTTF ≅ 7×L10 = 140,000 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%), and

Stress/Elevated Temperature T <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°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 MTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
70	40	8.00	56	2.303	994	2,374.0	334,483	47,783

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2007/9/14 9:00 AM	2007/12/9 7:39 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	2374.0

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 <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	22.63	946,062	135,152
30	16.00	668,967	95,567
40	8.00	334,483	47,783
50	4.00	167,242	23,892
60	2.00	83,621	11,946
70	1.00	41,810	5,973

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**  
 **Accept**  
 **Reject**

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2007100	1081.00	2008/2/5 8:00 AM	XIAO.QIAN	ANGLER.LIU



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ASB0305HA-C/-CA01	ASB0312LA-D/-DF00/-DR00
ASB0305LA-D/-DF00/-DR00	ASB0312MA-D/-DF00/-DR00
ASB0305MA-D/-DF00/-DR00	ASB0312HA-D/-DF00/-DR00

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
994	2007/9/14 9:00 AM	2007/12/9 7:39 PM	56	0	<b>2374.0</b>
Representative Test P/N :ASB0312HA-C			<b>Current Test Status</b> <input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination		
Equipment: 1.Oven: E24-W577					

### 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)	
	<b>140MAX.</b>	<b>140MAX.</b>	<b>15% MAX.</b>	<b>10500 REF</b>	<b>10500 REF</b>	<b>15% MAX.</b>	<b>32.0MAX.</b>	<b>32.0MAX.</b>	<b>3 dB MAX.</b>
1	68	62	-8.8	9335	9041	-3.1	26.4	26.9	0.5
2	66	62	-6.1	9341	9107	-2.5	25.9	26.7	0.8
3	67	76	13.4	9160	8929	-2.5	27.0	26.6	-0.4
4	67	63	-6.0	9175	8961	-2.3	26.2	26.4	0.2
5	67	74	10.4	9250	9422	1.9	25.6	26.3	0.7
6	66	62	-6.1	9522	9130	-4.1	25.8	26.3	0.5
7	66	63	-4.5	9592	9076	-5.4	25.8	26.7	0.9
8	66	62	-6.1	9488	9293	-2.1	26.1	26.8	0.7
9	67	58	-13.4	9182	9762	6.3	26.1	26.5	0.4
10	66	61	-7.6	9789	9582	-2.1	26.3	26.5	0.2
11	65	59	-9.2	9286	9637	3.8	25.9	26.4	0.5
12	72	63	-12.5	8985	9198	2.4	26.3	26.3	0.0
13	67	62	-7.5	9394	9108	-3.0	26.7	26.2	-0.5
14	67	66	-1.5	9439	9589	1.6	26.1	26.4	0.3
15	66	60	-9.1	9544	9441	-1.1	26.3	26.2	-0.1
16	72	76	5.6	9111	9362	2.8	26.4	26.9	0.5
17	67	64	-4.5	9352	8952	-4.3	26.2	26.5	0.3
18	67	76	13.4	9462	9359	-1.1	25.9	26.4	0.5
19	66	60	-9.1	9619	9178	-4.6	25.8	26.2	0.4
20	66	67	1.5	9287	9497	2.3	26.2	26.8	0.6
21	65	70	7.7	9534	9178	-3.7	27.2	26.7	-0.5
22	65	74	13.8	9557	9774	2.3	25.9	26.9	1.0
23	66	62	-6.1	9321	9617	3.2	26.2	26.7	0.5
24	65	62	-4.6	9387	9287	-1.1	27.2	26.4	-0.8
25	69	76	10.1	9742	9274	-4.8	27.7	27.0	-0.7
26	69	60	-13.0	9635	9243	-4.1	27.4	26.2	-1.2
27	73	71	-2.7	9431	8966	-4.9	27.1	26.0	-1.1
28	72	77	6.9	8946	9298	3.9	27.4	26.2	-1.2
29	68	62	-8.8	9367	9526	1.7	26.5	26.5	0.0
30	69	75	8.7	9684	9363	-3.3	26.8	26.4	-0.4
31	64	67	4.7	9468	9057	-4.3	27.3	26.6	-0.7
32	64	59	-7.8	9469	9214	-2.7	27.2	26.6	-0.6
33	64	76	18.8	9451	9063	-4.1	27.5	26.7	-0.8
34	69	61	-11.6	9446	9154	-3.1	27.3	26.3	-1.0
35	69	76	10.1	9498	9214	-3.0	27.4	26.2	-1.2

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
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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)
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Representative Test P/N :ASB0312HA-C	<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-W577

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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)	
	<b>140MAX.</b>	<b>140MAX.</b>	<b>15% MAX.</b>	<b>10500 REF</b>	<b>10500 REF</b>	<b>15% MAX.</b>	<b>32.0MAX.</b>	<b>32.0MAX.</b>	<b>3 dB MAX.</b>
36	64	65	1.6	9579	9062	-5.4	27.2	26.5	-0.7
37	65	64	-1.5	9480	9096	-4.1	27.7	26.4	-1.3
38	64	66	3.1	9312	9149	-1.8	27.1	26.5	-0.6
39	68	77	13.2	9325	8981	-3.7	27.3	26.3	-1.0
40	64	65	1.6	9193	9006	-2.0	27.2	26.3	-0.9
41	69	69	0.0	9110	9677	6.2	26.9	26.2	-0.7
42	65	66	1.5	9260	9253	-0.1	27.4	27.2	-0.2
43	64	62	-3.1	9371	9109	-2.8	27.2	26.7	-0.5
44	64	66	3.1	9431	9183	-2.6	26.9	26.6	-0.3
45	65	74	13.8	9551	9179	-3.9	26.8	26.7	-0.1
46	65	64	-1.5	9228	8988	-2.6	27.2	26.8	-0.4
47	66	60	-9.1	9263	9343	0.9	27.6	26.2	-1.4
48	68	60	-11.8	9399	9220	-1.9	27.3	27.1	-0.2
49	69	59	-14.5	10163	9260	-8.9	27.5	26.9	-0.6
50	68	76	11.8	9376	9418	0.4	26.3	26.8	0.5
51	67	75	11.9	9416	9028	-4.1	25.9	26.9	1.0
52	68	63	-7.4	9573	9380	-2.0	26.1	26.6	0.5
53	68	62	-8.8	9448	9333	-1.2	26.2	26.5	0.3
54	68	65	-4.4	9113	9375	2.9	26.2	26.9	0.7
55	66	66	0.0	9411	9558	1.6	27.4	26.3	-1.1
56	64	59	-7.8	9348	9178	-1.8	26.9	26.4	-0.5
X-Bar	66.80	66.20	-	9403.6	9261.2	-	26.70	26.54	-
$\sigma$	2.211	6.100	-	202.684	216.423	-	0.617	0.269	-

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