



# 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 ASB 17X17X3mm series as the right table					
<b>Representative Test P/N :ASB0305HP-00CP4</b>		<b>(I:4023108100 ; F:4023106418 )</b>			
<b>Equipment: 1.Oven: E24-W520</b>					

© **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  $\cong$  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%), 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 MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
70	40	8.00	56	2.303	2,484	2,484.0	349,982	49,997

### Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2017/1/20 10:00 AM	2017/5/7 8:07 AM	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	2484.0

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	989,898	141,414
30	16.00	699,964	99,995
40	8.00	349,982	49,997
50	4.00	174,991	24,999
60	2.00	87,495	12,499
70	1.00	43,748	6,250

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 >3dB over the original measure noise.

<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
WJQEFML-2017014VD	82.00	2017/5/7 8:00 AM	KAL.GONG	TAOE.LIANG

BGN(dBA) : 18.0

Temp(°C) : 22.3

P(cmHg) : 76.4



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
2,484	2017/1/20 10:00 AM	2017/5/7 8:07 AM	56	0	<b>2484.0</b>

Representative Test P/N :ASB0305HP-00CP4

**Current Test Status**  
  In process  
  In process (exceed requested)  
  Termination

Equipment: 1.Oven: E24-W520

### Test Data Between Initial Test and Final Test(LARGE FAN)

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>500MAX.</b>	<b>500MAX.</b>	<b>15% MAX.</b>	<b>9500REF</b>	<b>9500REF</b>	<b>15% MAX.</b>	<b>33.0MAX.</b>	<b>33.0MAX.</b>	<b>3 dB MAX.</b>
1	158	159	0.6	8917	9251	3.7	28.9	28.6	-0.3
2	161	163	1.2	9130	9207	0.8	29.0	28.5	-0.5
3	156	161	3.2	9121	9284	1.8	27.7	29.0	1.3
4	165	165	0.0	9174	9441	2.9	29.6	28.6	-1.0
5	165	169	2.4	9267	9310	0.5	29.1	28.9	-0.2
6	163	158	-3.1	9186	9314	1.4	29.3	29.2	-0.1
7	162	159	-1.9	9434	9431	0.0	28.0	29.1	1.1
8	160	156	-2.5	9298	9362	0.7	28.2	28.7	0.5
9	159	161	1.3	9283	9279	0.0	28.1	28.6	0.5
10	163	163	0.0	9202	9146	-0.6	29.3	28.9	-0.4
11	161	160	-0.6	9326	9264	-0.7	28.7	28.7	0.0
12	158	165	4.4	9302	9210	-1.0	28.6	28.6	0.0
13	163	155	-4.9	9195	9258	0.7	29.3	29.1	-0.2
14	166	153	-7.8	9302	9173	-1.4	29.0	28.9	-0.1
15	162	160	-1.2	9568	9291	-2.9	29.0	29.0	0.0
16	163	165	1.2	9155	9011	-1.6	29.0	28.6	-0.4
17	163	162	-0.6	9184	9120	-0.7	28.6	28.7	0.1
18	164	160	-2.4	9253	9260	0.1	28.8	28.6	-0.2
19	164	160	-2.4	9283	9296	0.1	28.4	28.6	0.2
20	165	167	1.2	9136	9133	0.0	28.7	28.9	0.2
21	164	160	-2.4	9276	9202	-0.8	28.5	28.5	0.0
22	160	163	1.9	9226	9268	0.5	29.2	29.1	-0.1
23	164	157	-4.3	9059	9053	-0.1	28.9	29.3	0.4
24	162	158	-2.5	9187	9137	-0.5	29.4	29.2	-0.2
25	165	160	-3.0	9327	9233	-1.0	29.4	29.0	-0.4
26	155	158	1.9	9689	9520	-1.7	28.6	28.9	0.3
27	160	162	1.3	9321	9228	-1.0	28.6	29.1	0.5
28	161	157	-2.5	9391	9365	-0.3	28.1	28.7	0.6
29	160	158	-1.3	9439	9347	-1.0	29.0	28.6	-0.4
30	167	155	-7.2	9057	9237	2.0	28.7	29.0	0.3



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Representative Test P/N :ASB0305HP-00CP4

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### Test Data Between Initial Test and Final Test(LARGE FAN)

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>500MAX.</b>	<b>500MAX.</b>	<b>15% MAX.</b>	<b>9500REF</b>	<b>9500REF</b>	<b>15% MAX.</b>	<b>33.0MAX.</b>	<b>33.0MAX.</b>	<b>3 dB MAX.</b>
31	159	160	0.6	9213	9112	-1.1	28.9	29.1	0.2
32	162	165	1.9	9034	9305	3.0	29.2	28.9	-0.3
33	157	159	1.3	9243	9078	-1.8	28.5	28.6	0.1
34	165	166	0.6	9167	9245	0.9	28.7	28.6	-0.1
35	159	162	1.9	9035	9030	-0.1	27.9	28.9	1.0
36	161	162	0.6	9237	9461	2.4	28.8	28.8	0.0
37	161	164	1.9	9314	9195	-1.3	28.8	29.0	0.2
38	160	160	0.0	9240	9309	0.7	28.8	28.9	0.1
39	165	164	-0.6	9348	9168	-1.9	28.9	28.8	-0.1
40	158	152	-3.8	9086	9302	2.4	29.7	28.7	-1.0
41	158	160	1.3	9068	9269	2.2	28.5	29.3	0.8
42	162	165	1.9	9279	9235	-0.5	29.0	29.5	0.5
43	160	158	-1.3	9149	9300	1.7	29.9	29.1	-0.8
44	163	164	0.6	9143	9370	2.5	28.8	28.9	0.1
45	163	169	3.7	9217	9203	-0.2	28.2	29.5	1.3
46	153	157	2.6	9268	9216	-0.6	28.4	29.1	0.7
47	161	158	-1.9	9151	9289	1.5	28.9	29.0	0.1
48	158	161	1.9	9210	9215	0.1	28.7	29.5	0.8
49	156	159	1.9	9051	9208	1.7	28.6	28.9	0.3
50	162	159	-1.9	9192	9106	-0.9	29.2	29.3	0.1
51	158	162	2.5	9280	9238	-0.5	28.7	29.5	0.8
52	163	161	-1.2	9311	9300	-0.1	29.2	29.1	-0.1
53	163	158	-3.1	9428	9411	-0.2	29.1	29.4	0.3
54	159	159	0.0	9155	9225	0.8	29.0	28.9	-0.1
55	165	162	-1.8	9304	9287	-0.2	28.8	28.8	0.0
56	157	157	0.0	9389	9444	0.6	29.6	28.5	-1.1
X-Bar	161.20	160.57	-	9235.71	9252.71	-	28.83	28.92	-
$\sigma$	3.036	3.582	-	133.640	106.910	-	0.449	0.280	-

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WJQEFML-2017014VD	<b>82.00</b>	<b>2017/5/7 8:00 AM</b>	<b>KALGONG</b>	<b>TAOE.LIANG</b>