



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					
Representative Test P/N :ASB0305HP-00CP4 (I:4023108100 ; F:4023106418)					
Equipment: 1.Oven: E24-W520					

© **L₁₀ Expectancy:** **50,000** hours minimum @ fan rated voltage and the temperature of 40℃

According to the equation for **Weibull distribution**, **MTTF $\approx$ 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%), and

Stress/Elevated Temperature Ts (℃) (Actual Test Temperature)	Unstress Temperature Tu (℃)	Acceleration Factor AF	Quantity of Test Devices n (pcs)	Poisson Distribution Factor Br;c	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 ℃ (hours)	Verified L ₁₀ 40 ℃ (hours)
70	40	8.00	56	2.303	2,484	4,496.0	633,461	90,494

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	2017/5/9 12:07 PM	☐ In process	☐ In process (exceed requested)	☒ Termination	4496.0

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 (℃)	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	22.63	1,791,699	255,957
30	16.00	1,266,923	180,989
40	8.00	633,461	90,494
50	4.00	316,731	45,247
60	2.00	158,365	22,624
70	1.00	79,183	11,312

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-2017027VD	134.00	2017/8/1 8:00 AM	KAI.GONG	TAOE.LIANG

BGN(dBA) : 18.0

Temp(℃) : 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	2017/5/9 12:07 PM	56	0	4496.0

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)	
	500MAX.	500MAX.	15% MAX.	9500REF	9500REF	15% MAX.	33.0MAX.	33.0MAX.	3 dB MAX.
1	158	138	-12.7	8917	9326	4.6	28.9	28.6	-0.3
2	161	149	-7.5	9130	9368	2.6	29.0	29.3	0.3
3	156	145	-7.1	9121	9268	1.6	27.7	28.5	0.8
4	165	149	-9.7	9174	9330	1.7	29.6	29.2	-0.4
5	165	148	-10.3	9267	9382	1.2	29.1	28.7	-0.4
6	163	147	-9.8	9186	9424	2.6	29.3	29.3	0.0
7	162	146	-9.9	9434	8923	-5.4	28.0	29.1	1.1
8	160	146	-8.8	9298	9591	3.2	28.2	28.6	0.4
9	159	141	-11.3	9283	8932	-3.8	28.1	28.9	0.8
10	163	148	-9.2	9202	9392	2.1	29.3	29.3	0.0
11	161	139	-13.7	9326	9261	-0.7	28.7	28.6	-0.1
12	158	144	-8.9	9302	9365	0.7	28.6	29.3	0.7
13	163	149	-8.6	9195	9268	0.8	29.3	28.7	-0.6
14	166	149	-10.2	9302	9295	-0.1	29.0	28.9	-0.1
15	162	146	-9.9	9568	9330	-2.5	29.0	28.7	-0.3
16	163	147	-9.8	9155	9338	2.0	29.0	29.0	0.0
17	163	150	-8.0	9184	9268	0.9	28.6	28.6	0.0
18	164	146	-11.0	9253	9526	3.0	28.8	29.3	0.5
19	164	145	-11.6	9283	9348	0.7	28.4	28.6	0.2
20	165	148	-10.3	9136	9381	2.7	28.7	29.1	0.4
21	164	149	-9.1	9276	9594	3.4	28.5	28.6	0.1
22	160	147	-8.1	9226	9465	2.6	29.2	29.3	0.1
23	164	144	-12.2	9059	9326	2.9	28.9	28.3	-0.6
24	162	147	-9.3	9187	9265	0.8	29.4	28.5	-0.9
25	165	145	-12.1	9327	9318	-0.1	29.4	29.3	-0.1
26	155	162	4.5	9689	9254	-4.5	28.6	28.6	0.0
27	160	149	-6.9	9321	9285	-0.4	28.6	29.2	0.6
28	161	161	0.0	9391	9263	-1.4	28.1	28.3	0.2
29	160	150	-6.3	9439	9444	0.1	29.0	29.1	0.1
30	167	148	-11.4	9057	9263	2.3	28.7	28.7	0.0



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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.	Current Spec.		Speed Spec.	Speed Spec.		Noise Spec.	Noise Check.	
	(mA)	(mA)	(%)	(RPM)	(RPM)	(%)	(dB A)	(dB A)	
	500MAX.	500MAX.	15% MAX.	9500REF	9500REF	15% MAX.	33.0MAX.	33.0MAX.	3 dB MAX.
31	159	147	-7.5	9213	9403	2.1	28.9	29.3	0.4
32	162	150	-7.4	9034	9391	4.0	29.2	28.6	-0.6
33	157	147	-6.4	9243	9293	0.5	28.5	28.9	0.4
34	165	149	-9.7	9167	9338	1.9	28.7	29.2	0.5
35	159	145	-8.8	9035	9265	2.5	27.9	28.9	1.0
36	161	139	-13.7	9237	9324	0.9	28.8	29.3	0.5
37	161	149	-7.5	9314	9365	0.5	28.8	28.6	-0.2
38	160	147	-8.1	9240	9254	0.2	28.8	29.0	0.2
39	165	142	-13.9	9348	9265	-0.9	28.9	28.9	0.0
40	158	145	-8.2	9086	9328	2.7	29.7	29.6	-0.1
41	158	139	-12.0	9068	9326	2.8	28.5	28.7	0.2
42	162	147	-9.3	9279	9561	3.0	29.0	29.3	0.3
43	160	146	-8.8	9149	9448	3.3	29.9	28.6	-1.3
44	163	142	-12.9	9143	9265	1.3	28.8	29.3	0.5
45	163	147	-9.8	9217	9233	0.2	28.2	28.9	0.7
46	153	144	-5.9	9268	9405	1.5	28.4	28.8	0.4
47	161	148	-8.1	9151	9383	2.5	28.9	29.3	0.4
48	158	149	-5.7	9210	9328	1.3	28.7	28.9	0.2
49	156	145	-7.1	9051	9150	1.1	28.6	29.1	0.5
50	162	141	-13.0	9192	9139	-0.6	29.2	29.5	0.3
51	158	142	-10.1	9280	9386	1.1	28.7	28.6	-0.1
52	163	149	-8.6	9311	9285	-0.3	29.2	29.3	0.1
53	163	141	-13.5	9428	9379	-0.5	29.1	28.6	-0.5
54	159	139	-12.6	9155	9258	1.1	29.0	29.3	0.3
55	165	142	-13.9	9304	9169	-1.5	28.8	28.6	-0.2
56	157	138	-12.1	9389	9275	-1.2	29.6	29.3	-0.3
X-Bar	161.20	146.09	-	9235.71	9321.59	-	28.83	28.94	-
σ	3.036	4.530	-	133.640	121.596	-	0.449	0.331	-

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WJQEFML-2017027VD	134.00	2017/8/1 8:00 AM	KAL.GONG	TAOE.LIANG