



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 ASB35x35x10.5mm series as the right table	ASB03512HA-A	ASB03512MA-A			

Representative Test P/N :ASB03512HA-A
Equipment: 1.Oven: E24-W522

◎ **L₁₀ 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_{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)
70	40	8.00	55	2.303	1,010	2,394.0	331,816	47,402

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2007/12/5 10:00 AM	2008/1/31 4:04 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	2394.0

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	22.63	938,517	134,074
30	16.00	663,631	94,804
40	8.00	331,816	47,402
50	4.00	165,908	23,701
60	2.00	82,954	11,851
70	1.00	41,477	5,925

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
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2007146	364.00	2008/3/29 8:00 AM	YUHONG.SUN	ANGLER.LIU



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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 applies to ASB35x35x10.5mm series as the right table

ASB03512HA-A	ASB03512MA-A			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,010	2007/12/5 10:00 AM	2008/1/31 4:04 PM	55	0	2394.0

Representative Test P/N :ASB03512HA-A	Current Test Status	<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-W522

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)	
	140MAX.	140MAX.	15% MAX.	7000 REF	7000 REF	15% MAX.	27.0MAX.	27.0MAX.	3 dB MAX.
1	50	51	2.0	6822	7020	2.9	21.4	21.0	-0.4
2	45	50	11.1	6568	6713	2.2	21.8	20.8	-1.0
3	45	50	11.1	6794	6611	-2.7	21.5	21.3	-0.2
4	45	51	13.3	6692	6707	0.2	21.3	21.9	0.6
5	47	50	6.4	6644	6668	0.4	22.1	20.3	-1.8
6	53	51	-3.8	6425	6736	4.8	21.2	21.3	0.1
7	54	53	-1.9	6609	6427	-2.8	21.4	21.7	0.3
8	51	50	-2.0	6674	6545	-1.9	21.6	20.9	-0.7
9	52	49	-5.8	6577	7049	7.2	21.5	24.3	2.8
10	51	53	3.9	6652	6718	1.0	21.3	21.3	0.0
11	53	50	-5.7	6661	8075	21.2	21.3	24.1	2.8
12	52	51	-1.9	6562	6789	3.5	21.6	21.2	-0.4
13	50	51	2.0	6562	6602	0.6	21.4	20.9	-0.5
14	53	50	-5.7	6706	6627	-1.2	21.5	20.5	-1.0
15	53	52	-1.9	6643	6597	-0.7	21.2	21.4	0.2
16	51	51	0.0	6674	6821	2.2	21.0	20.5	-0.5
17	53	50	-5.7	6428	6861	6.7	21.3	20.6	-0.7
18	52	51	-1.9	6536	6538	0.0	21.7	24.0	2.3
19	51	53	3.9	6660	6622	-0.6	21.5	21.0	-0.5
20	52	50	-3.8	6578	6766	2.9	21.8	20.7	-1.1
21	51	51	0.0	6560	6625	1.0	21.4	20.7	-0.7
22	50	52	4.0	6594	6484	-1.7	21.2	21.5	0.3
23	51	48	-5.9	6588	7198	9.3	21.4	21.2	-0.2
24	54	54	0.0	6523	6843	4.9	22.0	20.8	-1.2
25	51	51	0.0	6658	6642	-0.2	22.2	21.0	-1.2
26	52	54	3.8	6650	7824	17.7	21.4	24.3	2.9
27	51	53	3.9	6685	8132	21.6	21.3	24.2	2.9
28	52	52	0.0	6668	6435	-3.5	21.5	20.8	-0.7
29	52	50	-3.8	6513	6814	4.6	21.6	21.4	-0.2
30	51	51	0.0	6563	6807	3.7	21.7	20.3	-1.4
31	51	52	2.0	6670	6800	1.9	21.3	20.7	-0.6
32	51	49	-3.9	6601	6719	1.8	21.5	21.3	-0.2
33	51	50	-2.0	6616	6634	0.3	21.3	21.7	0.4
34	52	49	-5.8	6618	6508	-1.7	21.2	21.5	0.3

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
WJQFML-2007146	364.00	2008/3/29 8:00 AM	YUHONG.SUN	ANGLER.LIU



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)
1,010	2007/12/5 10:00 AM	2008/1/31 4:04 PM	55	0	2394.0

Representative Test P/N :ASB03512HA-A	Current Test Status	<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-W522

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)	
	140MAX.	140MAX.	15% MAX.	7000 REF	7000 REF	15% MAX.	27.0MAX.	27.0MAX.	3 dB MAX.
35	51	50	-2.0	6510	6752	3.7	21.5	21.6	0.1
36	50	51	2.0	6588	6996	6.2	21.4	20.9	-0.5
37	50	51	2.0	6541	6693	2.3	21.3	21.0	-0.3
38	50	51	2.0	6589	6588	0.0	21.1	21.3	0.2
39	51	53	3.9	6524	6444	-1.2	21.5	20.9	-0.6
40	51	56	9.8	6647	6649	0.0	21.2	21.3	0.1
41	52	52	0.0	6572	6597	0.4	21.5	24.0	2.5
42	49	51	4.1	6552	6616	1.0	21.4	20.7	-0.7
43	50	51	2.0	6640	6799	2.4	21.7	20.6	-1.1
44	50	52	4.0	6657	6933	4.1	21.6	24.4	2.8
45	51	50	-2.0	6636	6767	2.0	21.3	21.0	-0.3
46	50	49	-2.0	6563	6579	0.2	21.5	21.3	-0.2
47	51	50	-2.0	6514	6720	3.2	21.2	20.7	-0.5
48	50	51	2.0	6612	6861	3.8	21.3	20.0	-1.3
49	50	51	2.0	6575	6514	-0.9	21.3	20.3	-1.0
50	50	51	2.0	6606	6167	-6.6	21.5	21.7	0.2
51	49	56	14.3	6594	6217	-5.7	21.4	20.8	-0.6
52	49	50	2.0	6511	6535	0.4	21.4	21.6	0.2
53	50	54	8.0	6567	6853	4.4	21.2	21.0	-0.2
54	50	51	2.0	6774	6693	-1.2	21.5	21.5	0.0
55	49	50	2.0	6670	6716	0.7	21.6	21.4	-0.2
X-Bar	50.65	51.16	-	6607.6	6757.2	-	21.45	21.44	-
σ	1.898	1.619	-	77.009	355.914	-	0.232	1.135	-

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