

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 <b>AFB 70x70x15 mm</b> series as the right table	AFB0712HHB	AFB0712HB	AFB0712MB	AFB0712LB	
	AFB0724HHB	AFB0724HB	AFB0724MB	AFB0724LB	
	AFB0712HHC	AFB0712HC	AFB0712MC	AFB0712LC	

<b>Representative Test P/N :AFB0712HHB</b>	
<b>Equipment:</b> 1.Oven: F00-5, E24-T060 2. DC Source: GW GPC-3060D	On/Off Cycles: Every 500 hours

**L<sub>10</sub> Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40**

According to the equation for Weibull distribution, **MTTF 7×L<sub>10</sub> = 490,000 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 Ts ( )	Unstress Temperature Tu ( )	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 (hours)	Verified L <sub>10</sub> 40 (hours)
70	40	8.00	56	2.303	3,478	13,513.0	1,903,907	271,987

### Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2002/6/13 9:30 AM	2002/12/20 5:16 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	13513.0

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' L<sub>10</sub> 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. Basically , MTBF is equal to MTTF , they use same formula to work out a life data. )

Temperature for MTTF Estimation ( )	Acceleration Factor A <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	22.63	5,385,061	769,294
30	16.00	3,807,813	543,973
40	8.00	1,903,907	271,987
50	4.00	951,953	135,993
60	2.00	475,977	67,997
70	1.00	237,988	33,998

Fan permission criteria for the measurement after test :

1. For current, the limit is less than spec.(max.).
2. For speed, the allowable decrease is less than 15%.
3. For noise, the limit is less than spec.(max.). + 3 dB

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
02FNL015	1078.00	2004/2/11 8:30 AM	Rola Liu	Y.Y. Shieh



# 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 AFB 70x70x15 mm series as the right table

AFB0712HHB	AFB0712HB	AFB0712MB	AFB0712LB
AFB0724HHB	AFB0724HB	AFB0724MB	AFB0724LB
AFB0712HHC	AFB0712HC	AFB0712MC	AFB0712LC

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
3,478	2002/6/13 9:30 AM	2002/11/20 6:16 PM	56	0	13513.0

Representative Test P/N :AFB0712HHB	Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
-------------------------------------	---------------------	-------------------------------------	--	---

Equipment: 1.Oven: F00-5, E24-T060 2. DC Source: GW GPC-3060D On/Off Cycles: Every 500 hours

### Test Data Between Initial Test and Final Test

Sample P/N :AFB0712HHB

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)
	Current Spec. (A) <b>0.45 Max.</b>	Current Spec. (A) <b>0.45 Max.</b>		Speed Spec. (RPM) <b>4300 Ref.</b>	Speed Spec. (RPM) <b>4300 Ref.</b>		Noise Spec. (dB A) <b>42.5 Max.</b>	Noise Spec. (dB A) <b>45.5 Max.</b>	
1	0.25	0.24	-4.0	4225	4268	1.0	38.4	40.4	5.2
2	0.26	0.23	-11.5	4379	4327	-1.2	38.9	40.4	3.9
3	0.26	0.23	-11.5	4300	4302	0.0	42.1	41.9	-0.5
4	0.25	0.23	-8.0	4316	4373	1.3	38.5	40.1	4.2
5	0.25	0.28	12.0	4240	4398	3.7	38.4	40.0	4.2
6	0.26	0.24	-7.7	4285	4231	-1.3	38.7	40.7	5.2
7	0.25	0.24	-4.0	4225	4318	2.2	38.4	40.0	4.2
8	0.26	0.24	-7.7	4210	4234	0.6	38.4	39.8	3.6
9	0.26	0.28	7.7	4270	4423	3.6	38.2	40.5	6.0
10	0.25	0.24	-4.0	4300	4323	0.5	42.1	40.4	-4.0
11	0.25	0.24	-4.0	4225	4295	1.7	38.4	40.2	4.7
12	0.26	0.24	-7.7	4270	4312	1.0	38.2	40.7	6.5
13	0.25	0.24	-4.0	4300	4337	0.9	42.1	40.8	-3.1
14	0.26	0.23	-11.5	4363	4349	-0.3	38.6	40.4	4.7
15	0.26	0.23	-11.5	4316	4321	0.1	38.5	40.5	5.2
16	0.26	0.24	-7.7	4255	4329	1.7	38.1	43.0	12.9
17	0.26	0.24	-7.7	4285	4317	0.7	38.7	40.4	4.4
18	0.26	0.24	-7.7	4210	4244	0.8	38.4	40.7	6.0
19	0.26	0.24	-7.7	4255	4265	0.2	38.1	39.8	4.5
20	0.26	0.23	-11.5	4210	4291	1.9	38.4	40.5	5.5
21	0.25	0.24	-4.0	4270	4230	-0.9	38.2	40.2	5.2
22	0.26	0.24	-7.7	4285	4250	-0.8	38.7	40.6	4.9
23	0.26	0.23	-11.5	4240	4317	1.8	38.4	39.8	3.6
24	0.26	0.24	-7.7	4225	4306	1.9	38.4	41.2	7.3
25	0.26	0.23	-11.5	4225	4305	1.9	38.1	40.5	6.3
26	0.26	0.23	-11.5	4270	4273	0.1	38.2	40.2	5.2
27	0.26	0.24	-7.7	4210	4246	0.9	38.4	40.9	6.5
28	0.26	0.24	-7.7	4300	4304	0.1	42.1	40.5	-3.8
29	0.26	0.24	-7.7	4240	4323	2.0	38.4	40.4	5.2
30	0.26	0.24	-7.7	4316	4318	0.0	38.5	41.1	6.8
31	0.26	0.23	-11.5	4255	4366	2.6	38.1	41.2	8.1
32	0.26	0.23	-11.5	4270	4298	0.7	38.2	40.2	5.2
33	0.26	0.24	-7.7	4240	4247	0.2	38.4	40.8	6.3
34	0.26	0.24	-7.7	4300	4266	-0.8	42.1	40.5	-3.8
35	0.26	0.24	-7.7	4270	4269	0.0	38.2	40.0	4.7

