

DC FAN LIFE EXPERIMENT REPORT

Available for these models with lower speed and same	EFB0505HA	EFB0505MA	EFB0505LA				
physical structure. All model may be followed by Rxx or Fxx	EFB0512HHA	EFB0512HA	EFB0512MA	EFB0512LA			
series suffixes. This test report applies to EFB 50x50x10 mm							
series as the right table							
Representative Test P/N : EFB0512HHA-F00							
Instruments used: 1.Oven: F00-5, E24-T060 2. DC Source: GW GPC-3060D							

 \bigcirc L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C According to the equation for Weibull distribution, MTTF \rightleftharpoons 7×L10 = 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,

$$t = 1.036 \times MTTF \times [(B_{r;c}) \div n]^{0.91} \div A_F$$
, and $A_F = 2^{(Ts-Tu)/10}$

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 (°C)	Unstress Temperature Tu (℃)	Acceleration Factor A _F	Quantity of Test Devices n (pcs)	$\begin{array}{c} Poisson \\ Distribution \\ Factor \\ B_{r;c} \end{array}$	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF (hours)	Verified L ₁₀ (hours)
80	40	16.00	20	2.303	4,438	5,197	573,803	81,972

Test Progress:

Date for Test	Date for Test	Current Test Status		Current Total Test	
Beginning	Termination (at least)			Time (hours)	
2000/8/7 8:00 AM	2001/2/8 6:00 AM	In process	In process (exceed requested)	✓ Termination	5197

Herewith, we could assume as right on the basis of above test result. Temperature for Acceleration Estimated L₁₀ Estimated MTTF Estimation Factor Besides, if the actual test time exceed the required, it comes out that MTTF (hours) (hours) A_F (°C) those fans' L_{10} expectancy and MTTF are greater than the warrant. (1,622,960 25 MTTF: means Mean Time To Failures, it should be used in a non-45.25 231,851 repairable system setting. Now we show the MTTF in our life report, 30 32.00 1,147,606 163,944 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 40 16.00 573,803 81,972 repairable system setting. Basically, MTBF is equal to MTTF, they use same formula to work out a life data.) 50 8.00 286,901 40,986 Fan Failure Criteria: 60 4.00 20,493 143,451 1. For current, the limit is less than spec.(max.). 70 2.00 71,725 10,246 2. For speed, the allowable descrease is less than 15%. 3. For noise, the limit is less than spec.(max.). + 3 dB 80 1.00 35,863 5.123

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
A231L-05	1116	2001/4/27 9:00 AM	Bomico Chang	Poter Sur

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DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

EFB0505LA EFB0505HA EFB0505MA Available for these models with lower speed and same physical EFB0512HHA EFB0512HA EFB0512MA EFB0512LA structure. All model may be followed by Rxx or Fxx series suffixes. This test report applies to EFB 50x50x10 mm series as the right table **Required Test Time Current Total Test Date for Test Date for Test** Sample Size **Failure Termination** (hrs) **Beginning** (pcs): (pcs): Time (hrs) 2000/8/7 8:00 AM 2001/2/8 6:00 AM 5197.0 4,438 20 () In process $\overline{\mathbf{A}}$ **Current Test Status** presentative Test P/N: EFB0512HHA-F00 exceed requested In process Termination Instruments used: 1.Oven: F00-5, E24-T060 2. DC Source: GW GPC-3060D **Test Data Between Initial Test and Final Test** Sample P/N: EFB0512HHA-F00 Initial Test Final Test Initial Test Final Test Initial Test Final Test Sample Deviation Deviation Deviation Current Spec. Current Spec. Speed Spec. Speed Spec. Noise Spec. Noise Spec. No. (A) (A) (%)(RPM) (RPM) (%)(dBA) (dBA) (%) 0.21 Max. 0.21 Max. 6500 Ref. 6500-15% 40.5 Max. 43.5 Max. 0.16 0.16 0.0 6522 6522 0.0 35.3 36.8 4.2 2 0.17 0.17 0.0 6450 6816 5.7 35.1 35.5 1.1 0.16 0.17 6.3 6594 6978 5.8 35.2 35.9 2.0 3 0.16 6702 6978 34.7 35.6 0.16 0.0 4.1 2.6 4 0.17 0.16 5.9 6558 6666 35.7 34.4 5 3.6 1.6 6 0.16 0.16 0.0 6522 6816 4.5 35.4 43.2 22.0 0.16 0.16 6816 35.9 7 0.0 6630 2.8 35.8 0.3 8 0.15 0.16 6594 7140 35.2 35.6 6.7 8.3 1.1 9 0.16 0.16 0.0 6522 6978 7.0 35.4 36.2 2.3 10 0.16 0.16 0.0 6594 6816 35.1 35.5 3.4 1.1 0.16 0.16 6282 6978 34.8 35.4 11 0.0 11.1 1.7 12 0.16 0.17 6.3 6558 6816 3.9 34.3 36.2 5.5 0.16 0.16 0.0 6450 6978 8.2 35.0 35.7 2.0 13 14 0.16 0.16 0.0 6558 6816 3.9 35.2 36.1 2.6 0.15 6594 6816 34.5 15 0.16 6.7 3.4 36.2 4.9 0.15 6.7 6522 6816 4.5 34.8 4.3 16 0.16 36.3 0.16 0.16 6252 6816 9.0 35.4 35.5 17 0.0 0.3 0.16 0.17 6552 6816 35.7 38.1 18 6.3 4.0 6.7 19 0.17 0.17 0.0 6534 6816 35.2 35.8 4.3 1.7 20 0.17 0.17 0.0 6624 6816 2.9 34.8 36.3 4.3 X-Bar 0.161 0.163 6531 6851 35.1 36.3 0.006 0.005 107.481 130.046 0.396 1.768 Time-out for function **Issued Date** Reported By OE File No. **Approved By** test or others (hrs) Bomica Chang A231L-05 1116 2001/4/27 9:00 AM