

DC FAN LIFE EXPERIMENT REPORT

Equipment: 1.Oven: F00-5, E24-T060 2. DC Source: GW GPC-3060D On/Off Cycles: Every 500 hours								
Representative Test P/N : AFB0612HHB								
mm series as the right table								
series suffixes. This test report applies to AFB 60x60x15	AFB0624HHB	AFB0624HB	AFB0624MB	AFB0624LB				
physical structure. All model may be followed by Rxx or Fxx	AFB0612HHB	AFB0612HB	AFB0612MB	AFB0612LB				
Available for these models with lower speed and same	AFB0605HHB	AFB0605HB	AFB0605MB	AFB0605LB				

 \odot L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C

According to the equation for Weibull distribution,

 $MTTF = 7 \times L10 =$

490,000 hours

Estimated L₁₀

(hours)

Estimated MTTF

(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,

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

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 (°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 $^{\circ}$ C (hours)
80	40	16.00	19	2.303	4,650	9,004.0	948,799	135,543

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
1996/11/2 8:00 AM	1997/5/23 4:02 AM	In process	In process (exceed requested)	✓ Termination	9004.0

Herewith, we could assume as right on the basis of above test result. Temperature for Acceleration MTTF Estimation Factor Besides, if the actual test time exceed the required, it comes out that (°C) A_F those fans' L., expectancy and MTTE are greater than the warrant

those rans L_{10} expectancy and MTTF are greater than the warrant. (, , ,			
MTTF: means Mean Time To Failures, it should be used in a non-	25	45.25	2,683,608	383,373
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.	30	32.00	1,897,597	271,085
MTBF: means Mean Time Between failures, it should be used in a repairable system setting. Basically, MTBF is equal to MTTF, they	40	16.00	948,799	135,543
use same formula to work out a life data.)	50	8.00	474,399	67,771
Fan permission criteria for the measurement after test:	60	4.00	237,200	33,886
 For current, the limit is less than spec.(max.). For speed, the allowable descrease is less than 15%. 	70	2.00	118,600	16,943
3. For noise, the limit is less than spec.(max.). + 3 dB	80	1.00	59,300	8,471

QE File No.	Time-out for function test or others (hours)	CCHAC LISTA	Reported By	Approved By	
A023	194.00	1997/11/20 2:00 PM	BONNIE . CHENG	Potor Sun	

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DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

	•				A EDOCOCIHID	AEDOCOCIID	4 ED0 (05) (D	A EDOCOCI D		
Available for	these models with	lower speed and	same physical	structure. All	AFB0605HHB	AFB0605HB	AFB0605MB	AFB0605LB		
model may be followed by Rxx or Fxx series suffixes. This test report applie				AFB0612HHB	AFB0612HB	AFB0612MB	AFB0612LB			
-	0x15 mm series a			1 11	AFB0624HHB	AFB0624HB	AFB0624MB	AFB0624LB		
		,								
Require	d Test Time	Date fo	or Test	Date f	for Test	Sample Size	Failure	Current '	Total Test	
(hrs)	Begin	ning	Term	ination	(pcs):	(pcs):	Time	(hrs)	
4	,650	1996/11/2	8:00 AM	1997/5/2	3 4:02 AM	19	0	900	9004.0	
								In process	V	
Representative Test P/N : AFB0612HHB					Current Test Status		In process	(exceed requested)	Termination	
Equipmen	t: 1.Oven: F0	0-5, E24-T0	060 2. DC	Source: G	W GPC-306	50D	On/Off Cyc	les: Every 50	00 hours	
			Test Data	Between I	nitial Test a	ınd Final Te	st			
Sample P/N	: GFB0412VHF	-F00								
Sampla	Initial Test	Final Test	Deviation	Initial Test	Final Test	Deviation	Initial Test	Final Test	Deviation	
Sample	Current Spec.	Current Spec.	Deviation	Speed Spec.	Speed Spec.	Deviation	Noise Spec.	Noise Spec.	Deviation	
No.	(A) 0.18 Max.	(A) 0.18 Max.	(%)	(RPM) 4500 Ref.	(RPM) 4500-15%	(%)	(dBA) 38.0 Max	(dBA) 41.0 Max	(%)	
1	0.16	0.16	0.0	4564	4953	8.5	34.3	37.1	8.2	
2	0.17	0.16	-5.9	4501	4985	10.8	33.4	37.2	11.4	
3	0.17	0.16	-5.9	4532	5047	11.4	34.4	37.5	9.0	
4	0.16	0.16	0.0	4545	4932	8.5	35.4	37.0	4.5	
5	0.17	0.16	-5.9	4515	4863	7.7	33.7	36.7	8.9	
6	0.17	0.16	-5.9	4493	4935	9.8	33.8	37.0	9.5	
7	0.17	0.16	-5.9	4523	5017	10.9	34.3	37.4	9.0	
8	0.17	0.16	-5.9	4516	5017	11.1	33.6	37.4	11.3	
9	0.16	0.16	0.0	4515	4931	9.2	33.6	37.0	10.1	
10	0.17	0.16	-5.9	4539	4943	8.9	35.0	37.0	5.7	
11	0.17	0.16	-5.9	4526	4893	8.1	33.7	36.8	9.2	
12	0.17	0.16	-5.9	4489	4911	9.4	34.0	36.9	8.5	
13	0.17	0.16	-5.9	4522	4984	10.2	32.9	37.2	13.1	
14	0.16	0.16	0.0	4529	4860	7.3	33.7	36.7	8.9	
15	0.16	0.17	6.3	4543	4938	8.7	33.9	37.0	9.1	
16	0.17	0.16	-5.9	4540	4971	9.5	33.8	37.2	10.1	
17	0.17	0.16	-5.9	4503	4963	10.2	34.0	37.1	9.1	
18	0.16	0.16	0.0	4532	5012	10.6	34.7	37.3	7.5	
19	0.16	0.16	0.0	4546	4963	9.2	33.6	37.1	10.4	
X-Bar	0.166	0.161	-	4525	4954	-	34.0	37.1	-	
σ	0.005	0.002	-	19.573	50.935	-	0.587	0.224	-	
QE I	QE File No. Time-out for function test or others (hrs)		Issue	ied Date Rej		ted By	Approved By			
A023 194 1		1997/11/2	20 2:00 PM	BONNIE . CHENG Pot		Poto	r Sun			