



DC FAN CUSTOMIZED LIFE EXPERIMENT TEST 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 BFB 120x120x32 mm series as the right table	BFB1212VH	BFB1224VH	BFB1212HH	BFB1224HH	BFB1248HH
	BFB1248H	BFB1248M	BFB1248L		
	BFB1224H	BFB1224M	BFB1224L		
	BFB1212H	BFB1212M	BFB1212L		

Representative Test P/N : BFB1212VH

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

© L₁₀ Expectancy: **50,000** hours minimum @ fan rated voltage and the temperature of 40°C
 According to the equation for Weibull distribution MTTF ≅ 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,

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

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 (°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 (hours)	Verified L ₁₀ (hours)
60	40	4.00	56	2.303	4,968	9,968.0	702,218	100,317

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2004/9/4 8:30 AM	2005/6/5 11:15 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	9968.0

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. Basically, MTBF is equal to MTTF, they use same formula to work out a life data.)

Temperature for MTTF Estimation (°C)	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	11.31	1,986,172	283,739
30	8.00	1,404,436	200,634
40	4.00	702,218	100,317
45	2.83	496,543	70,935
50	2.00	351,109	50,158
55	1.41	248,272	35,467
60	1.00	175,554	25,079

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	Issued Date	Reported By	Approved By
TH04FNL056	1610.50	2005/12/30 7:00 PM	CH.SIROTE	LUC



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	BFB1248H	BFB1248M	BFB1248L		
	BFB1224H	BFB1224M	BFB1224L		
	BFB1212H	BFB1212M	BFB1212L		

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
4,968	2004/9/4 8:30 AM	2005/6/5 11:15 AM	56	0	9968.0

Representative Test P/N : BFB1212VH	Current Test Status	<input type="checkbox"/>	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
	In process			

Instruments used: 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 : **BFB1212VH**

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)
	Current Spec. (A) 1.88 Max.	Current Spec. (A) 1.88 Max.		Speed Spec. (RPM) 3100 Ref.	Speed Spec. (RPM) 3100-15%		Noise Spec. (dB A) 59.0 Max.	Noise Spec. (dB A) 62.0 Max.	
1	1.30	1.30	0.0	3147	3240	3.0	55.9	57.2	2.3
2	1.31	1.28	-2.3	3192	3231	1.2	56.1	58.9	4.9
3	1.35	1.32	-2.2	3123	3222	3.2	56.1	57.7	2.8
4	1.30	1.27	-2.3	3103	3203	3.2	56.2	57.9	3.1
5	1.30	1.27	-2.3	3173	3274	3.2	56.1	58.0	3.3
6	1.30	1.29	-0.8	3166	3267	3.2	56.8	57.0	0.3
7	1.30	1.29	-0.8	3172	3270	3.1	56.4	58.5	3.8
8	1.30	1.29	-0.8	3154	3265	3.5	56.9	58.5	2.8
9	1.31	1.28	-2.3	3143	3206	2.0	55.8	59.0	5.8
10	1.31	1.30	-0.8	3179	3263	2.6	57.1	59.9	4.9
11	1.33	1.30	-2.3	3185	3205	0.6	56.2	59.2	5.3
12	1.31	1.30	-0.8	3215	3274	1.8	57.5	56.9	-1.1
13	1.32	1.28	-3.0	3176	3202	0.8	57.4	59.6	3.9
14	1.31	1.29	-1.5	3162	3255	2.9	56.1	61.3	9.2
15	1.30	1.29	-0.8	3130	3223	3.0	56.6	60.5	7.0
16	1.30	1.29	-0.8	3174	3249	2.4	56.8	56.9	0.3
17	1.30	1.26	-3.1	3191	3271	2.5	57.4	56.8	-1.0
18	1.32	1.31	-0.8	3165	3261	3.0	57.0	57.7	1.2
19	1.34	1.31	-2.2	3154	3200	1.5	56.7	60.2	6.3
20	1.29	1.27	-1.6	3179	3275	3.0	56.5	57.2	1.2
21	1.30	1.29	-0.8	3183	3285	3.2	58.3	58.1	-0.4
22	1.29	1.28	-0.8	3187	3262	2.4	56.7	57.4	1.2
23	1.31	1.29	-1.5	3155	3202	1.5	56.3	56.7	0.7
24	1.38	1.36	-1.4	3198	3249	1.6	58.8	57.8	-1.7
25	1.29	1.29	0.0	3184	3260	2.4	56.2	59.5	6.0
26	1.30	1.28	-1.5	3158	3250	2.9	58.4	57.8	-1.0
27	1.31	1.30	-0.8	3181	3289	3.4	56.5	57.4	1.6
28	1.31	1.29	-1.5	3185	3261	2.4	56.6	57.0	0.7
29	1.30	1.30	0.0	3158	3232	2.3	56.2	57.6	2.5
30	1.30	1.31	0.8	3187	3285	3.1	56.4	56.9	0.9
31	1.29	1.28	-0.8	3174	3250	2.4	57.7	59.7	3.4
32	1.30	1.28	-1.5	3201	3282	2.5	56.3	57.9	2.8
33	1.30	1.31	0.8	3185	3266	2.5	56.7	57.0	0.6
34	1.30	1.29	-0.8	3189	3268	2.5	56.8	60.1	5.9
35	1.29	1.31	1.6	3168	3246	2.5	56.5	57.0	1.0



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Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
4,968	2004/9/4 8:30 AM	2005/6/5 11:15 AM	56	0	9968.0

Representative Test P/N : BFB1212VH	Current Test Status	<input type="checkbox"/>	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
		In process		

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Test Data Between Initial Test and Final Test

Sample P/N :BFB1212VH

Sample No.	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)	Initial Test	Final Test	Deviation (%)
	Current Spec. (A) 1.88 Max.	Current Spec. (A) 1.88 Max.		Speed Spec. (RPM) 3100 Ref.	Speed Spec. (RPM) 2635 Min.		Noise Spec. (dB A) 59.0 Max.	Noise Spec. (dB A) 62.0 Max.	
36	1.29	1.28	-0.8	3182	3277	3.0	57.7	58.0	0.5
37	1.30	1.28	-1.5	3176	3263	2.7	56.9	57.2	0.6
38	1.30	1.29	-0.8	3174	3276	3.2	58.3	57.1	-2.1
39	1.30	1.30	0.0	3115	3278	5.2	56.8	57.7	1.6
40	1.30	1.28	-1.5	3204	3243	1.2	56.2	60.1	7.0
41	1.29	1.27	-1.6	3167	3240	2.3	56.8	57.4	1.1
42	1.31	1.28	-2.3	3195	3232	1.2	57.7	61.2	6.0
43	1.30	1.28	-1.5	3169	3253	2.7	56.6	58.7	3.7
44	1.31	1.31	0.0	3157	3230	2.3	56.2	57.4	2.2
45	1.32	1.28	-3.0	3138	3253	3.7	56.7	57.2	1.0
46	1.31	1.28	-2.3	3188	3231	1.3	57.8	57.5	-0.6
47	1.30	1.29	-0.8	3175	3217	1.3	58.0	56.7	-2.3
48	1.34	1.28	-4.5	3173	3235	2.0	58.0	57.1	-1.6
49	1.31	1.28	-2.3	3186	3240	1.7	58.2	58.7	0.9
50	1.32	1.28	-3.0	3207	3272	2.0	56.5	57.4	1.7
51	1.38	1.36	-1.4	3216	3293	2.4	58.4	58.4	0.1
52	1.31	1.29	-1.5	3198	3274	2.4	56.3	58.0	3.1
53	1.32	1.30	-1.5	3138	3210	2.3	56.2	56.3	0.1
54	1.30	1.28	-1.5	3189	3260	2.2	57.7	57.4	-0.4
55	1.30	1.29	-0.8	3174	3253	2.5	57.8	56.8	-1.7
56	1.32	1.30	-1.5	3147	3098	-1.6	55.8	59.0	5.8
X-Bar	1.31	1.29	-	3172.21	3247.70	-	56.90	58.07	-
σ	0.04	0.04	-	47.88	67.13	-	1.55	2.42	-

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TH04FNL056	1610.50	2005/12/30 7:00 PM	CH.SIRIROTE	LUC