



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 GFB40x40x50.8 mm series as the right table					

Representative Test P/N :GFB0412SHG-F00

Equipment: 1.Oven: E24-M0026 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,

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

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%).

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)
80	40	16.00	100	2.303	733	3,540.0	1,690,737	241,534

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2004/10/20 9:30 PM	2005/2/11 10:49 PM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	3540.0

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	45.25	4,782,126	683,161
30	32.00	3,381,474	483,068
40	16.00	1,690,737	241,534
50	8.00	845,368	120,767
60	4.00	422,684	60,383
70	2.00	211,342	30,192
80	1.00	105,671	15,096

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

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
DG04FNL180	2004.50	2005/6/8 10:00 PM	Guie.Lin	Gx.Xu

Note: The test sample equivalent to STD , Part number: GFB0412EHG-F00.



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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)
733	2004/10/20 9:30 PM	2005/2/11 10:49 PM	100	0	3540.0
Representative Test P/N :GFB0412SHG-F00			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)
				<input checked="" type="checkbox"/> Termination	

Equipment: 1.Oven: E24-M0026 On/Off Cycles: Every 500 hours

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. (A) 1.02Max.	Current Spec. (A) 1.02Max.		Speed Spec. (RPM) 12000-15%(7Imp) 10600-15%(5Imp)	Speed Spec. (RPM) 12000-15% 10600-15%		Noise Spec. (dB A) 64.0Max	Noise Spec. (dB A) 64.0Max	
1	0.94	0.92	-2.1	12416	12545	1.0	62.1	63.0	1.4
				11423	11418	0.0			
2	0.79	0.80	1.3	12218	12712	4.0	62.3	62.3	0.0
				11211	11336	1.1			
3	0.86	0.84	-2.3	12569	12715	1.2	62.5	62.1	-0.6
				11373	11419	0.4			
4	0.91	0.89	-2.2	12683	12573	-0.9	62.5	61.9	-1.0
				11241	11403	1.4			
5	0.83	0.82	-1.2	12643	12617	-0.2	62.1	62.4	0.5
				11382	11307	-0.7			
6	0.95	0.93	-2.1	12656	12813	1.2	62.3	62.0	-0.5
				11358	11205	-1.3			
7	0.85	0.85	0.0	12750	12403	-2.7	62.9	62.3	-1.0
				11397	11402	0.0			
8	0.92	0.90	-2.2	12590	12587	0.0	62.5	62.3	-0.3
				11403	11055	-3.1			
9	0.81	0.80	-1.2	12611	12369	-1.9	62.7	62.2	-0.8
				11701	11357	-2.9			
10	0.88	0.86	-2.3	12131	12697	4.7	62.2	62.4	0.3
				11292	11586	2.6			
11	0.90	0.88	-2.2	12567	12583	0.1	62.7	62.0	-1.1
				11406	11023	-3.4			
12	0.92	0.91	-1.1	12424	12810	3.1	62.3	61.9	-0.6
				11326	10976	-3.1			
13	0.84	0.83	-1.2	12723	12848	1.0	62.5	62.1	-0.6
				11382	11341	-0.4			
14	0.83	0.83	0.0	12849	12712	-1.1	62.1	62.3	0.3
				11318	11004	-2.8			
15	0.86	0.85	-1.2	12622	12614	-0.1	62.2	62.0	-0.3
				11304	11305	0.0			
16	0.86	0.86	0.0	12517	12683	1.3	62.4	62.4	0.0
				11232	11068	-1.5			
17	0.89	0.89	0.0	12483	12576	0.7	62.7	62.0	-1.1
				11301	10847	-4.0			
18	0.86	0.85	-1.2	12565	12743	1.4	62.6	62.1	-0.8
				11538	11267	-2.3			
19	0.82	0.80	-2.4	12588	12576	-0.1	62.2	62.1	-0.2
				11389	11354	-0.3			

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL180	2004.50	2005/6/8 10:00 PM	Guie.Lin	Gx.Xu



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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)
733	2004/10/20 9:30 PM	2005/2/11 10:49 PM	100	0	3540.0
Representative Test P/N :GFB0412SHG-F00			Current Test Status		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-M0026				On/Off Cycles: Every 500 hours	

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A)	Final Test Current Spec. (A)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Spec. (dB A)	Deviation (%)
	1.02Max.	1.02Max.		12000-15%(7Imp) 10600-15%(5Imp)	12000-15% 10600-15%		64.0Max	64.0Max	
20	0.86	0.87	1.2	12906	12613	-2.3	62.4	62.4	0.0
				11383	11476	0.8			
21	0.85	0.85	0.0	12695	12576	-0.9	62.5	62.2	-0.5
				11398	11276	-1.1			
22	0.84	0.84	0.0	12533	12349	-1.5	62.2	62.0	-0.3
				11317	11364	0.4			
23	0.85	0.84	-1.2	12915	12743	-1.3	62.4	62.4	0.0
				11238	11183	-0.5			
24	0.79	0.78	-1.3	12050	12668	5.1	61.8	62.3	0.8
				11183	11267	0.8			
25	0.85	0.85	0.0	12686	12593	-0.7	62.3	62.1	-0.3
				11428	11087	-3.0			
26	0.82	0.80	-2.4	12724	12729	0.0	61.9	62.0	0.2
				11330	11067	-2.3			
27	0.87	0.85	-2.3	11608	12493	7.6	62.7	62.4	-0.5
				11406	11502	0.8			
28	0.89	0.86	-3.4	12784	12493	-2.3	62.2	62.0	-0.3
				11367	11502	1.2			
29	0.87	0.86	-1.1	12530	12650	1.0	62.5	61.9	-1.0
				11383	10131	-11.0			
30	0.83	0.82	-1.2	12564	12764	1.6	61.9	62.0	0.2
				11225	10967	-2.3			
31	0.78	0.77	-1.3	12395	12373	-0.2	61.7	62.4	1.1
				11246	10577	-5.9			
32	0.83	0.82	-1.2	12442	12537	0.8	62.3	62.0	-0.5
				11484	11054	-3.7			
33	0.88	0.86	-2.3	12522	12609	0.7	62.5	62.1	-0.6
				11168	10808	-3.2			
34	0.83	0.81	-2.4	12509	12567	0.5	61.9	61.9	0.0
				11467	11204	-2.3			
35	0.92	0.91	-1.1	12694	12653	-0.3	62.4	62.0	-0.6
				11404	11291	-1.0			
36	0.83	0.81	-2.4	12688	12438	-2.0	62.7	62.0	-1.1
				11367	11354	-0.1			
37	0.74	0.84	13.5	11765	12769	8.5	61.7	61.9	0.3
				10806	11327	4.8			
38	0.88	0.86	-2.3	12528	12376	-1.2	61.8	61.9	0.2
				11400	11268	-1.2			
39	0.91	0.90	-1.1	12819	12486	-2.6	62.4	62.3	-0.2
				11240	10975	-2.4			

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL180	2004.50	2005/6/8 10:00 PM	Guie.Lin	Gx.Xu



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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)
733	2004/10/20 9:30 PM	2005/2/11 10:49 PM	100	0	3540.0
Representative Test P/N :GFB0412SHG-F00			Current Test Status	<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination	
Equipment: 1.Oven: E24-M0026				On/Off Cycles: Every 500 hours	

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. (A)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	1.02Max.	1.02Max.		12000-15%(7Imp) 10600-15%(5Imp)	12000-15% 10600-15%		64.0Max	64.0Max	
40	0.87	0.85	-2.3	12800	12512	-2.3	62.7	62.1	-1.0
				11364	11439	0.7			
41	0.80	0.80	0.0	12411	12567	1.3	62.9	62.0	-1.4
				11331	11277	-0.5			
42	0.85	0.84	-1.2	12565	12756	1.5	61.7	62.1	0.6
				11421	11544	1.1			
43	0.85	0.85	0.0	12493	12493	0.0	62.5	62.1	-0.6
				11117	11348	2.1			
44	0.90	0.90	0.0	12250	12389	1.1	62.3	61.9	-0.6
				11207	11376	1.5			
45	0.90	0.89	-1.1	12624	12554	-0.6	62.7	62.3	-0.6
				11199	10896	-2.7			
46	0.86	0.84	-2.3	12594	12781	1.5	62.1	62.4	0.5
				11240	11322	0.7			
47	0.82	0.79	-3.7	12507	12606	0.8	61.9	62.0	0.2
				11381	11272	-1.0			
48	0.89	0.86	-3.4	12755	12916	1.3	62.3	61.9	-0.6
				11260	10639	-5.5			
49	0.85	0.85	0.0	12694	12736	0.3	62.5	62.3	-0.3
				11345	11311	-0.3			
50	0.89	0.88	-1.1	12470	12609	1.1	62.1	62.1	0.0
				11344	11403	0.5			
51	0.93	0.91	-2.2	12751	12869	0.9	62.7	62.3	-0.6
				11600	10204	-12.0			
52	0.89	0.87	-2.2	12648	12563	-0.7	62.5	62.4	-0.2
				11276	11349	0.6			
53	0.88	0.87	-1.1	12471	12604	1.1	61.8	62.4	1.0
				11246	11393	1.3			
54	0.88	0.87	-1.1	12970	12814	-1.2	62.2	61.9	-0.5
				11106	11344	2.1			
55	0.84	0.83	-1.2	12533	12743	1.7	62.7	62.0	-1.1
				11056	11207	1.4			
56	0.91	0.90	-1.1	12654	12809	1.2	62.3	62.0	-0.5
				11234	11101	-1.2			
57	0.82	0.81	-1.2	12341	12388	0.4	62.2	62.0	-0.3
				11490	11325	-1.4			
58	0.83	0.82	-1.2	12704	12776	0.6	62.7	61.9	-1.3
				11299	11324	0.2			
59	0.88	0.87	-1.1	12925	12874	-0.4	62.5	62.1	-0.6
				11463	11433	-0.3			
60	0.84	0.84	0.0	12396	12569	1.4	62.1	62.3	0.3
				11223	11386	1.5			

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL180	1793.00	2005/4/11 10:30 PM	Guie.Lin	Gx.Xu



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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)
733	2004/10/20 9:30 PM	2005/2/11 10:49 PM	100	0	3540.0
Representative Test P/N :GFB0412SHG-F00			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination
Equipment: 1.Oven: E24-M0026				On/Off Cycles: Every 500 hours	

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A)	Final Test Current Spec. (A)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Spec. (dB A)	Deviation (%)
	1.02Max.	1.02Max.		12000-15%(7Imp) 10600-15%(5Imp)	12000-15% 10600-15%		64.0Max	64.0Max	
61	0.88	0.87	-1.1	12013	12646	5.3	62.4	62.1	-0.5
				11273	11025	-2.2			
62	0.86	0.85	-1.2	12357	12576	1.8	62.6	62.0	-1.0
				11139	11302	1.5			
63	0.83	0.81	-2.4	12434	12503	0.6	61.9	61.9	0.0
				11408	11407	0.0			
64	0.86	0.83	-3.5	12563	12738	1.4	62.3	61.9	-0.6
				11183	11256	0.7			
65	0.86	0.83	-3.5	13457	12337	-8.3	62.5	62.1	-0.6
				11276	10987	-2.6			
66	0.89	0.89	0.0	12654	12483	-1.4	61.8	62.0	0.3
				11207	10987	-2.0			
67	0.95	0.94	-1.1	12257	12576	2.6	62.1	62.3	0.3
				11288	11028	-2.3			
68	0.89	0.87	-2.2	12690	12407	-2.2	62.7	61.9	-1.3
				11456	11423	-0.3			
69	0.85	0.84	-1.2	11679	12654	8.3	62.3	62.3	0.0
				11351	11350	0.0			
70	0.84	0.84	0.0	12502	12801	2.4	62.5	62.0	-0.8
				11419	11176	-2.1			
71	0.88	0.85	-3.4	12766	12717	-0.4	61.7	61.8	0.2
				11417	11417	0.0			
72	0.86	0.83	-3.5	12527	12261	-2.1	62.1	62.3	0.3
				11450	11695	2.1			
73	0.84	0.84	0.0	12425	12493	0.5	62.3	62.0	-0.5
				11330	11135	-1.7			
74	0.88	0.88	0.0	12755	12580	-1.4	61.9	61.9	0.0
				11340	11283	-0.5			
75	0.89	0.88	-1.1	12459	12613	1.2	62.0	62.3	0.5
				11407	11307	-0.9			
76	0.87	0.86	-1.1	12802	12650	-1.2	62.5	61.9	-1.0
				11300	11256	-0.4			
77	0.94	0.93	-1.1	12769	12780	0.1	62.1	62.2	0.2
				11211	11334	1.1			
78	0.90	0.90	0.0	12499	12742	1.9	62.3	62.0	-0.5
				11406	11287	-1.0			
79	0.82	0.81	-1.2	12678	12639	-0.3	61.7	62.1	0.6
				11322	11407	0.8			
80	0.83	0.80	-3.6	12534	12433	-0.8	62.2	62.4	0.3
				11366	11266	-0.9			
81	0.87	0.86	-1.1	12416	12567	1.2	62.5	61.9	-1.0
				11291	11125	-1.5			

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL180	2004.50	2005/6/8 10:00 PM	Guie.Lin	Gx.Xu



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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)
733	2004/10/20 9:30 PM	2005/2/11 10:49 PM	100	0	3540.0

Representative Test P/N :GFB0412SHG-F00	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-M0026 On/Off Cycles: Every 500 hours

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. (A)	Current Spec. (A)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Spec. (dB A)	
	1.02Max.	1.02Max.		12000-15%(7Imp)	12000-15%		64.0Max	64.0Max	
82	0.86	0.85	-1.2	12100	12683	4.8	61.9	62.0	0.2
				11397	11309	-0.8			
83	0.83	0.82	-1.2	12757	12500	-2.0	62.3	62.3	0.0
				11223	11276	0.5			
84	0.83	0.82	-1.2	12493	12641	1.2	62.7	62.1	-1.0
				11178	11211	0.3			
85	0.88	0.87	-1.1	12682	12701	0.1	62.3	62.4	0.2
				11508	11098	-3.6			
86	0.91	0.90	-1.1	12408	12504	0.8	61.9	62.3	0.6
				11305	11256	-0.4			
87	0.84	0.85	1.2	12161	12352	1.6	61.7	62.1	0.6
				11451	11577	1.1			
88	0.78	0.78	0.0	12542	12417	-1.0	62.7	62.0	-1.1
				11426	11247	-1.6			
89	0.87	0.87	0.0	12689	12680	-0.1	62.2	61.9	-0.5
				11498	11345	-1.3			
90	0.93	0.92	-1.1	12627	12576	-0.4	62.5	62.0	-0.8
				11270	11286	0.1			
91	0.85	0.84	-1.2	12670	12617	-0.4	62.9	62.0	-1.4
				11465	11419	-0.4			
92	0.87	0.87	0.0	12618	12434	-1.5	62.2	61.9	-0.5
				11411	11317	-0.8			
93	0.84	0.84	0.0	12375	12516	1.1	61.8	62.1	0.5
				11336	11134	-1.8			
94	0.85	0.85	0.0	12644	12666	0.2	62.5	62.3	-0.3
				11217	11089	-1.1			
95	0.92	0.91	-1.1	12604	12712	0.9	62.3	62.0	-0.5
				11195	10978	-1.9			
96	0.90	0.89	-1.1	12857	12614	-1.9	62.6	61.8	-1.3
				11451	11034	-3.6			
97	0.88	0.87	-1.1	12369	12588	1.8	62.4	62.1	-0.5
				11174	11145	-0.3			
98	0.86	0.86	0.0	12818	12629	-1.5	62.5	61.9	-1.0
				12420	11418	-8.1			
99	0.87	0.87	0.0	12752	12711	-0.3	62.7	62.0	-1.1
				11453	11236	-1.9			
100	0.83	0.83	0.0	12686	12693	0.1	61.9	62.1	0.3
				11354	11357	0.0			
X-Bar	0.863	0.854	-	11963.6	11935.8	-	62.30	62.00	-
σ	0.039	0.036	-	648.296	722.733	-	0.316	0.176	-

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG04FNL180	2004.50	2005/6/8 10:00 PM	Guie.Lin	Gx.Xu