



DC FAN CUSTOMIZED LIFE EXPERIMENT 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 PFB120x120x38mm series as the right table	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%;">PFB1248XHE-CA60</td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td>PFB1212SE-00EA1</td><td></td><td></td><td></td></tr> <tr><td>PFB1212SE-00</td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td></tr> </table>	PFB1248XHE-CA60				PFB1212SE-00EA1				PFB1212SE-00							
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PFB1212SE-00																	

Representative Test P/N : PFB1248XHE-CA59

Equipment: 1.Oven: E24-F0165

◎ **L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40 °C**
 According to the equation for **Weibull distribution**, **MTTF ≅ 1.89×L10 = 132,300 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,

$$t = 1.119 \times \text{MTTF} \times [(B_{r;c}) \div n]^{0.33} \div A_F, \text{ and } A_F = 1.5^{(T_s - T_u)/10}$$

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)
70	40	3.38	56	2.303	15,303	11,360.0	98,213	51,964

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2013/7/7 4:00 PM	2019/9/17 6:48 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	11360.0

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	6.20	180,428	95,465
30	5.06	147,319	77,946
40	3.38	98,213	51,964
50	2.25	65,475	34,643
60	1.50	43,650	23,095
70	1.00	29,100	15,397

Fan permission criteria for the measurement after test :

1. Speed can not drop of ≥ 15% below the original measured rpm.
2. Current cannot increase > 15% of original measure current.
3. Noise cannot >3dB over the original measure noise.

Test Method according to IPC-9591.

Test Result	<input checked="" type="checkbox"/> Accept
	<input type="checkbox"/> Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG13FNL092	39000.00	2019/4/6	Poppy.Liang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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PFB1248XHE-CA60			
PFB1212SE-00EA1			
PFB1212SE-00			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
15,303	2013/7/7 4:00 PM	2019/9/17 6:48 AM	56	0	11360.0

Representative Test P/N : PFB1248XHE-CA59	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-F0165

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) 1.68 Max	Final Test Current Spec. (A) 1.68 Max	Deviation (%)	Initial Test Speed Spec. (RPM) 8730-10450	Final Test Speed Spec. (RPM) 8730-10450	Deviation (%)	Initial Test Noise Spec. (dB A) 78.3 Max	Final Test Noise Check. (dB A) 78.3 Max	Deviation 3 dB Max
1	1.40	1.41	0.6	9686	9812	1.3	73.5	74.9	1.4
2	1.37	1.45	5.6	9777	9793	0.2	73.2	74.9	1.7
3	1.40	1.55	10.4	9742	9817	0.8	73.6	73.4	-0.2
4	1.36	1.40	3.0	9772	9772	0.0	73.2	73.9	0.7
5	1.46	1.39	-5.1	9738	9793	0.6	73.1	74.6	1.5
6	1.42	1.37	-3.4	9737	9783	0.5	73.4	73.6	0.2
7	1.43	1.38	-3.1	9794	9789	-0.1	73.6	73.9	0.3
8	1.39	1.38	-1.0	9763	9780	0.2	73.8	74.5	0.7
9	1.43	1.37	-4.5	9706	9781	0.8	73.7	74.4	0.7
10	1.38	1.29	-7.0	9720	9687	-0.3	73.5	73.9	0.4
11	1.42	1.40	-0.9	9793	9818	0.3	73.6	75.1	1.5
12	1.40	1.35	-4.1	9761	9688	-0.7	73.3	73.3	0.0
13	1.36	1.43	4.8	9748	9800	0.5	73.9	74.1	0.2
14	1.44	1.40	-2.8	9771	9783	0.1	73.2	74.2	1.0
15	1.43	1.41	-1.2	9668	9748	0.8	73.4	73.6	0.2
16	1.41	1.42	0.4	9751	9753	0.0	73.6	73.5	-0.1
17	1.31	1.42	8.7	9760	9798	0.4	73.2	74.2	1.0
18	1.38	1.37	-0.6	9729	9740	0.1	73.3	74.1	0.8
19	1.31	1.31	0.1	9722	9738	0.2	73.8	74.3	0.5
20	1.40	1.41	0.6	9714	9746	0.3	73.7	74.2	0.5
21	1.40	1.35	-3.6	9745	9745	0.0	73.1	74.1	1.0
22	1.34	1.39	3.6	9734	9752	0.2	73.6	74.3	0.7
23	1.41	1.44	1.6	9766	9830	0.7	73.4	74.4	1.0
24	1.42	1.37	-3.2	9767	9735	-0.3	73.5	73.8	0.3
25	1.36	1.38	1.2	9767	9705	-0.6	73.2	74.2	1.0
26	1.38	1.38	-0.4	9692	9797	1.1	73.3	74.2	0.9
27	1.34	1.36	1.6	9701	9772	0.7	73.4	74.0	0.6
28	1.38	1.36	-1.7	9766	9735	-0.3	73.8	75.3	1.5
29	1.32	1.38	4.6	9735	9750	0.2	73.6	74.2	0.6
30	1.40	1.39	-0.9	9745	9784	0.4	73.9	73.8	-0.1
31	1.32	1.39	5.6	9760	9740	-0.2	73.7	73.6	-0.1
32	1.36	1.38	1.3	9758	9744	-0.1	73.8	74.3	0.5

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG13FNL092	39000.00	2019/4/6	Poppy.Liang	Tim.Yi



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	PFB1212SE-00EA1			
	PFB1212SE-00			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
15,303	2013/7/7 4:00 PM	2019/9/17 6:48 AM	56	0	11360.0
Representative Test P/N : PFB1248XHE-CA59			Current Test Status	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination

Equipment: 1.Oven: E24-F0165

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec.	Final Test Current Spec.	Deviation (%)	Initial Test Speed Spec.	Final Test Speed Spec.	Deviation (%)	Initial Test Noise Spec.	Final Test Noise Check.	Deviation 3 dB Max
	(A) 1.68 Max	(A) 1.68 Max		(RPM) 8730-10450	(RPM) 8730-10450		(dB A) 78.3 Max	(dB A) 78.3 Max	
33	1.38	1.36	-1.6	9775	9735	-0.4	73.5	74.0	0.5
34	1.39	1.43	2.7	9779	9739	-0.4	73.0	74.2	1.2
35	1.37	1.40	1.8	9699	9768	0.7	73.6	73.4	-0.2
36	1.38	1.38	-0.2	9697	9747	0.5	73.4	74.0	0.6
37	1.42	1.53	7.7	9775	9802	0.3	73.2	74.2	1.0
38	1.42	1.37	-3.5	9749	9768	0.2	73.3	74.3	1.0
39	1.39	1.40	0.4	9726	9745	0.2	73.4	74.0	0.6
40	1.34	1.34	-0.1	9744	9740	0.0	73.5	73.4	-0.1
41	1.31	1.42	8.7	9736	9775	0.4	73.3	73.6	0.3
42	1.36	1.39	2.3	9702	9785	0.9	73.8	74.2	0.4
43	1.33	1.34	1.1	9761	9717	-0.5	73.7	74.0	0.3
44	1.36	1.41	3.8	9715	9771	0.6	73.9	74.6	0.7
45	1.40	1.40	0.2	9739	9813	0.8	73.1	74.1	1.0
46	1.44	1.39	-4.1	9771	9764	-0.1	73.3	73.2	-0.1
47	1.46	1.43	-2.1	9779	9818	0.4	73.9	73.9	0.0
48	1.43	1.48	3.1	9746	9802	0.6	73.8	74.5	0.7
49	1.48	1.37	-7.0	9790	9757	-0.3	73.7	73.9	0.2
50	1.47	1.53	4.2	9732	9702	-0.3	73.5	74.0	0.5
51	1.32	1.37	3.9	9787	9777	-0.1	73.2	73.4	0.2
52	1.42	1.45	2.0	9744	9797	0.5	73.6	75.4	1.8
53	1.40	1.40	0.1	9774	9728	-0.5	73.4	73.9	0.5
54	1.44	1.46	1.9	9752	9746	-0.1	73.2	74.6	1.4
55	1.32	1.40	6.2	9767	9772	0.1	73.3	74.2	0.9
56	1.32	1.33	1.1	9767	9860	1.0	73.3	73.2	-0.1
X-Bar	1.388	1.398	-	9745.945	9765.018	-	73.482	74.105	-
σ	0.044	0.048	-	29.380	33.625	-	0.245	0.475	-

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