



## 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 FFB 38x38x28.0 mm series as the right table	FFB03812VN-SP08	FFB03812VN-SPCX02		
	FFB03812VN-DH70			
	FFB03812VN-DEA			
	FFB0312VN-SPC			

<b>Representative Test P/N : FFB03812VN-SPB</b>	
<b>Equipment: 1.Oven: E24-F0058</b>	<b>On/Off Cycles: Every 500 hours</b>

◎ **L<sub>10</sub> 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<sub>r,c</sub>) 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 <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°C)	Acceleration Factor A <sub>F</sub>	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B <sub>r,c</sub>	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
80	40	5.06	56	2.303	10,202	10,202.0	132,302	70,001

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2012/11/15 4:00 PM	2015/3/11 4:22 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	<b>10202.0</b>

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' L<sub>10</sub> 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 <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	9.30	243,054	128,600
30	7.59	198,453	105,001
40	5.06	132,302	70,001
45	4.13	108,024	57,155
50	3.38	88,201	46,667
60	2.25	58,801	31,112
70	1.50	39,200	20,741
80	1.00	26,134	13,827

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.

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

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG12FNL163	10090.50	2015/3/25	NaNa.Wang	Tim.Yi

BGN (dBA) : 15.8

Temp (°C) : 21.2



## DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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 FFB 38x38x28.0 mm series as the right table

FFB03812VN-SP08	FFB03812VN-SPCX02		
FFB03812VN-DH70			
FFB03812VN-DEA			
FFB0312VN-SPC			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
10,202	2012/11/15 4:00 PM	2015/3/11 4:22 AM	56	0	<b>10202.0</b>

Representative Test P/N : FFB03812VN-SPB	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination
--	----------------------------	-------------------------------------	--	---

Equipment: 1.Oven: E24-F0058      On/Off Cycles: Every 500 hours

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (mA)	Final Test Current Spec. (mA)	Deviation (%)	Initial Test Speed Spec. (RPM)	Final Test Speed Spec. (RPM)	Deviation (%)	Initial Test Noise Spec. (dB A)	Final Test Noise Check. (dB A)	Deviation
	1020 Max.	1020 Max.		21160-24840	21160-24840		66.5 Max	66.5 Max	
1	819	803	-2.0	22286	22106	-0.8	64.3	62.7	-1.6
2	881	780	-11.5	22186	22267	0.4	64.5	60.3	-4.2
3	877	858	-2.2	21954	22752	3.6	64.1	60.2	-3.9
4	834	810	-2.9	22679	22540	-0.6	64.7	60.5	-4.2
5	814	801	-1.6	22784	22703	-0.4	64.3	60.2	-4.1
6	915	807	-11.8	21942	22304	1.6	64.6	60.8	-3.8
7	818	768	-6.1	22407	22171	-1.1	64.5	60.2	-4.3
8	917	828	-9.7	22234	22896	3.0	64.0	60.4	-3.6
9	818	800	-2.2	22977	22383	-2.6	64.7	60.8	-3.9
10	791	771	-2.5	22812	22640	-0.8	64.2	61.0	-3.2
11	823	834	1.3	22883	22783	-0.4	64.4	60.3	-4.1
12	885	895	1.1	22633	21987	-2.9	64.6	60.5	-4.1
13	823	794	-3.5	23010	22008	-4.4	64.1	61.2	-2.9
14	913	806	-11.7	21618	22682	4.9	64.8	60.7	-4.1
15	813	858	5.5	22527	22962	1.9	64.2	60.7	-3.5
16	881	787	-10.7	22286	22330	0.2	64.4	60.9	-3.5
17	813	818	0.6	22231	22120	-0.5	64.6	61.1	-3.5
18	853	861	0.9	22942	22353	-2.6	64.3	60.3	-4.0
19	806	809	0.4	22384	22823	2.0	64.0	60.5	-3.5
20	832	819	-1.6	22818	22728	-0.4	64.1	60.2	-3.9
21	837	889	6.2	22430	21837	-2.6	64.7	60.4	-4.3
22	840	828	-1.4	22742	22871	0.6	64.4	60.6	-3.8
23	885	806	-8.9	22127	22261	0.6	64.2	60.8	-3.4
24	860	796	-7.4	22322	22637	1.4	64.6	61.0	-3.6
25	805	806	0.1	22900	22276	-2.7	64.8	61.2	-3.6
26	851	879	3.3	22909	22172	-3.2	64.3	60.3	-4.0
27	841	894	6.3	23248	21356	-8.1	64.5	60.5	-4.0
28	929	853	-8.2	21767	22713	4.3	64.1	60.7	-3.4
29	923	847	-8.2	22047	22873	3.7	64.5	60.4	-4.1
30	863	801	-7.2	21792	22199	1.9	64.2	60.6	-3.6
31	867	792	-8.7	22750	22789	0.2	64.7	60.7	-4.0
32	863	849	-1.6	21883	22248	1.7	64.4	61.0	-3.4

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG12FNL163	10090.50	2015/3/25	NaNa.Wang	Tim.Yi



## DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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 FFB 38x38x28.0 mm series as the right table				FFB03812VN-SP08	FFB03812VN-SPCX02					
				FFB03812VN-DH70						
				FFB03812VN-DEA						
				FFB0312VN-SPC						
<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>					
10,202	2012/11/15 4:00 PM	2015/3/11 4:22 AM	56	0	<b>10202.0</b>					
Representative Test P/N : FFB03812VN-SPB				<b>Current Test Status</b>		<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination		
				Equipment: 1.Oven: E24-F0058				On/Off Cycles: Every 500 hours		
<b>Test Data Between Initial Test and Final Test</b>										
Sample No.	Initial Test Current Spec. (mA) 1020 Max.	Final Test Current Spec. (mA) 1020 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 21160-24840	Final Test Speed Spec. (RPM) 21160-24840	Deviation (%)	Initial Test Noise Spec. (dB A) 66.5 Max	Final Test Noise Check. (dB A) 66.5 Max	Deviation 3 dB Max	
33	918	794	-13.5	22029	22183	0.7	64.8	60.2	-4.6	
34	961	860	-10.5	21953	22877	4.2	64.2	60.9	-3.3	
35	860	824	-4.2	22848	22828	-0.1	64.6	60.3	-4.3	
36	808	844	4.5	22306	22240	-0.3	64.1	60.5	-3.6	
37	921	869	-5.6	21808	22125	1.5	64.4	60.7	-3.7	
38	824	818	-0.7	22361	22709	1.6	64.3	60.9	-3.4	
39	819	795	-2.9	22345	22259	-0.4	64.6	61.1	-3.5	
40	793	868	9.5	22333	21797	-2.4	64.0	60.2	-3.8	
41	820	777	-5.2	23078	22197	-3.8	64.5	60.4	-4.1	
42	811	844	4.1	22736	22755	0.1	64.3	60.6	-3.7	
43	857	845	-1.4	21998	22762	3.5	64.6	60.8	-3.8	
44	892	791	-11.3	21926	22276	1.6	64.5	61.0	-3.5	
45	873	817	-6.4	22261	22753	2.2	64.8	60.2	-4.6	
46	945	810	-14.3	22351	22753	1.8	64.2	60.4	-3.8	
47	816	855	4.8	22255	23166	4.1	64.7	61.2	-3.5	
48	845	820	-3.0	22932	22184	-3.3	64.3	60.3	-4.0	
49	860	895	4.1	23105	21976	-4.9	64.5	60.5	-4.0	
50	860	869	1.0	22804	22758	-0.2	64.1	60.7	-3.4	
51	813	812	-0.1	23163	22758	-1.7	64.6	60.9	-3.7	
52	798	786	-1.5	22901	22661	-1.0	64.4	61.1	-3.3	
53	808	788	-2.5	23113	22867	-1.1	64.7	60.2	-4.5	
54	944	891	-5.6	21591	22307	3.3	64.2	60.4	-3.8	
55	832	765	-8.1	22899	22039	-3.8	64.3	60.6	-3.7	
56	787	794	0.9	22245	22184	-0.3	64.0	60.8	-3.2	
X-Bar	852.768	824.607	-	22461.625	22449.714	-	64.402	60.654	-	
$\sigma$	44.600	35.769	-	439.831	363.199	-	0.238	0.415	-	
<b>QE File No.</b>		<b>Time-out for function test or others (hrs)</b>		<b>Issued Date</b>		<b>Reported By</b>		<b>Approved By</b>		
DG12FNL163		10090.50		2015/3/25		NaNa.Wang		Tim.Yi		