



DC FAN 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 ND 30X30X4.5mm series as the right table					
Representative Test P/N :ND35B00-17J17		(I:4023117527; F:4023117527 SLEEVE:3430424400)			
Equipment: 1.Oven: E24-W520					

◎ **L₁₀ Expectancy:** **30,000** hours minimum @ fan rated voltage and the temperature of 40°C

According to the equation for **Weibull distribution**, **MTTF ≅ 7×L10 = 210,000** 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%), and

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 MTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
70	40	8.00	56	2.303	1,490	1,491.0	210,074	30,011

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2018/8/29 10:00 AM	2018/11/1 11:28 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	1491.0

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 MTF are greater than the warrant. (MTF : means Mean Time To Failures, it should be used in a non-repairable system setting. Now we show the MTF 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 MTF Estimation (°C)	Acceleration Factor A _F	Estimated MTF (hours)	Estimated L ₁₀ (hours)
25	22.63	594,178	84,883
30	16.00	420,147	60,021
40	8.00	210,074	30,011
50	4.00	105,037	15,005
60	2.00	52,518	7,503
70	1.00	26,259	3,751

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 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
WJQEFML-2018182VD	47.00	2018/11/1 12:00 PM	YUHONG.SUN	Fly.shi

BGN(dBA) : 18.0

Temp(°C) : 22.3

P(cmHg) : 76.4



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination (at least)	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,490	2018/8/29 10:00 AM	2018/11/1 11:28 AM	56	0	1491.0
Representative Test P/N :ND35B00-17J17			Current Test Status	<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination	

Equipment: 1.Oven: E24-W520

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. (mA)	Current Spec. (mA)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Check. (dB A)	
	120MAX.	120MAX.	15% MAX.	10500REF	10500REF	15% MAX.	55.5MAX.	55.5MAX.	3 dB MAX.
1	85	88	3.5	10687	10324	-3.4	47.3	47.5	0.2
2	83	85	2.4	10390	10145	-2.4	46.9	47.6	0.7
3	86	86	0.0	10375	10020	-3.4	47.0	47.2	0.2
4	87	86	-1.1	10074	9976	-1.0	47.1	47.6	0.5
5	85	89	4.7	10534	9864	-6.4	47.4	48.1	0.7
6	86	87	1.2	10234	9862	-3.6	47.3	47.5	0.2
7	86	87	1.2	10410	9993	-4.0	47.7	47.3	-0.4
8	84	86	2.4	10721	10312	-3.8	47.5	48.2	0.7
9	84	85	1.2	10638	10101	-5.0	48.1	47.5	-0.6
10	85	85	0.0	10436	10168	-2.6	47.2	48.2	1.0
11	87	86	-1.1	10325	10094	-2.2	47.7	47.6	-0.1
12	84	88	4.8	10205	9957	-2.4	47.4	48.1	0.7
13	88	88	0.0	10053	9826	-2.3	47.1	47.5	0.4
14	85	89	4.7	10510	9756	-7.2	47.0	47.5	0.5
15	87	86	-1.1	10324	10102	-2.2	48.1	48.2	0.1
16	85	88	3.5	10279	9912	-3.6	47.7	47.9	0.2
17	81	87	7.4	10324	9991	-3.2	47.1	47.9	0.8
18	88	87	-1.1	10493	10089	-3.9	47.2	47.5	0.3
19	85	89	4.7	10375	10058	-3.1	47.4	48.3	0.9
20	86	87	1.2	10741	10215	-4.9	48.0	47.5	-0.5
21	87	87	0.0	10323	10196	-1.2	47.4	47.9	0.5
22	85	87	2.4	10117	9929	-1.9	47.1	48.1	1.0
23	88	86	-2.3	10404	9641	-7.3	47.7	47.5	-0.2
24	84	89	6.0	10584	9921	-6.3	48.1	48.2	0.1
25	86	87	1.2	10277	9974	-2.9	47.8	48.5	0.7
26	86	82	-4.7	10243	10896	6.4	46.8	47.5	0.7
27	87	87	0.0	10229	9981	-2.4	47.2	48.1	0.9
28	85	86	1.2	10438	9924	-4.9	47.4	48.1	0.7
29	85	87	2.4	10507	9982	-5.0	47.1	47.6	0.5
30	84	85	1.2	10505	9940	-5.4	47.9	48.5	0.6



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Representative Test P/N :ND35B00-17J17			Current Test Status		<input type="checkbox"/> In process <input type="checkbox"/> In process (exceed requested) <input checked="" type="checkbox"/> Termination

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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. (mA)	Current Spec. (mA)		Speed Spec. (RPM)	Speed Spec. (RPM)		Noise Spec. (dB A)	Noise Check. (dB A)	
	120MAX.	120MAX.	15% MAX.	10500REF	10500REF	15% MAX.	55.5MAX.	55.5MAX.	3 dB MAX.
31	81	87	7.4	10994	10357	-5.8	47.1	47.6	0.5
32	81	84	3.7	10365	10360	0.0	47.7	47.2	-0.5
33	86	86	0.0	10099	9707	-3.9	47.9	48.2	0.3
34	87	88	1.1	10398	10060	-3.3	46.9	47.5	0.6
35	87	88	1.1	10233	10020	-2.1	47.9	48.6	0.7
36	85	86	1.2	10248	9937	-3.0	47.0	47.5	0.5
37	84	86	2.4	10678	9964	-6.7	47.1	47.9	0.0
38	86	86	0.0	10177	10425	2.4	48.3	48.3	0.0
39	88	86	-2.3	10220	10602	3.7	46.9	47.3	0.4
40	85	85	0.0	10268	10138	-1.3	47.5	48.2	0.7
41	86	88	2.3	9747	10042	3.0	47.8	47.5	-0.3
42	87	87	0.0	10258	10025	-2.3	47.5	47.9	0.4
43	85	86	1.2	10235	10084	-1.5	48.2	48.1	-0.1
44	79	85	7.6	10352	10113	-2.3	47.6	48.3	0.7
45	86	86	0.0	10350	10081	-2.6	47.9	47.1	-0.8
46	87	87	0.0	10054	9861	-1.9	47.5	47.6	0.1
47	87	86	-1.1	10455	10350	-1.0	47.7	47.9	0.2
48	85	87	2.4	10427	10127	-2.9	47.2	48.2	1.0
49	85	85	0.0	10094	10115	0.2	46.8	47.3	0.5
50	86	86	0.0	10211	10024	-1.8	47.4	47.8	0.4
51	85	86	1.2	10142	10167	0.2	47.6	48.0	0.4
53	86	85	-1.2	10245	10310	0.6	47.7	47.6	-0.1
53	84	87	3.6	10616	10161	-4.3	47.7	48.2	0.5
54	85	86	1.2	10348	9875	-4.6	47.4	47.5	0.1
55	83	86	3.6	10759	10101	-6.1	47.1	47.9	0.8
56	84	86	2.4	10635	9889	-7.0	47.6	47.5	-0.1
X-Bar	85.25	86.48	-	10363.63	10072.21	-	47.46	47.81	-
σ	1.832	1.307	-	217.029	212.324	-	0.385	0.376	-

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