



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 BUB 60x59.9x23.0mm series as the right table	BUB0612MJ-00ARJ	BUB0612HJ-00Y1D		
	BUB0612MJ-00YUR			
	BUB0612HJ-00W6B			
	BUB0612HJ-00ZNR			

Representative Test P/N : BUB0612HJ-00AKZ

Equipment: 1.Oven: E24-T0161

◎ **L₁₀ Expectancy: 10,000 hours minimum @ fan rated voltage and the temperature of 60°C**

According to the equation for **Weibull distribution**, $MTTF \doteq 7 \times L_{10} = 70,000 \text{ hours}$

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%).

Stress/Elevated Temperature T _s (°C) <small>(Actual Test Temperature)</small>	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 60 °C (hours)	Verified L ₁₀ 60 °C (hours)
75	60	2.83	56	2.303	1,405	2,360.0	117,560	16,794

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2015/7/15 1:50 PM	2015/9/20 5:04 PM	<input checked="" type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	2360.0

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	32.00	1,330,044	190,006
30	22.63	940,483	134,355
40	11.31	470,241	67,177
50	5.66	235,121	33,589
60	2.83	117,560	16,794
70	1.41	58,780	8,397
75	1.00	41,564	5,938

Fan permission criteria for the measurement after test :

1. Speed can not drop of $\geq 15\%$ below the original measured rpm.
2. Current cannot increase $> 15\%$ of original measure current.
3. Noise cannot $> 3\text{dB}$ over the original measure noise.

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
DG15FNL083	206.00	2015/11/6	Loly.Wang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				BUB0612MJ-00YUR					
				BUB0612HJ-00W6B					
				BUB0612HJ-00ZNR					
Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)				
1,405	2015/7/15 1:50 PM	2015/9/20 5:04 PM	56	0	2360.0				
Representative Test P/N : BUB0612HJ-00AKZ			Current Test Status		<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination		
Equipment: 1.Oven: E24-T0161									
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (mA) 550 Max.	Final Test Current Spec. (mA) 550 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5400-6600	Final Test Speed Spec. (RPM) 5400-6600	Deviation (%)	Initial Test Noise Spec. (dB A) 47.0 Max	Final Test Noise Spec. (dB A) 47.0 Max	Deviation 3 dBMax.
1	429	420	-2.1	6127	6070	-0.9	41.3	41.8	0.5
2	428	429	0.2	6083	6002	-1.3	41.1	41.5	0.4
3	426	430	0.9	6084	6079	-0.1	40.8	42.0	1.2
4	482	428	-11.2	5534	6026	8.9	41.0	41.7	0.7
5	423	420	-0.7	6125	6164	0.6	41.2	41.9	0.7
6	436	427	-2.1	6119	6170	0.8	41.0	41.3	0.3
7	429	426	-0.7	6166	6181	0.2	41.5	41.6	0.1
8	425	434	2.1	6101	6006	-1.6	40.6	41.8	1.2
9	431	421	-2.3	6140	6174	0.6	41.1	41.4	0.3
10	428	428	0.0	6147	6078	-1.1	40.8	42.1	1.3
11	432	428	-0.9	6041	6022	-0.3	41.3	42.3	1.0
12	433	428	-1.2	6143	6089	-0.9	41.5	41.3	-0.2
13	421	426	1.2	6090	6074	-0.3	40.5	41.5	1.0
14	438	436	-0.5	6220	6052	-2.7	40.7	41.7	1.0
15	432	430	-0.5	6110	6068	-0.7	41.1	42.0	0.9
16	439	430	-2.1	6144	6093	-0.8	40.9	42.2	1.3
17	427	430	0.7	6104	6164	1.0	41.3	41.9	0.6
18	431	435	0.9	6075	6170	1.6	41.5	41.4	-0.1
19	438	435	-0.7	6127	6059	-1.1	40.6	41.6	1.0
20	420	430	2.4	6090	6241	2.5	41.0	42.1	1.1
21	434	431	-0.7	6113	6173	1.0	41.2	41.8	0.6
22	432	426	-1.4	6123	6060	-1.0	40.9	42.2	1.3
23	431	436	1.2	6127	6080	-0.8	41.4	41.3	-0.1
24	434	430	-0.9	6131	6167	0.6	40.5	41.5	1.0
25	435	431	-0.9	6127	6201	1.2	40.7	42.0	1.3
26	436	430	-1.4	6191	6078	-1.8	41.2	42.2	1.0
27	440	432	-1.8	6105	6051	-0.9	41.0	41.8	0.8
28	427	437	2.3	6071	6048	-0.4	40.8	41.6	0.8
29	427	431	0.9	6121	6078	-0.7	40.5	42.3	1.8
30	442	434	-1.8	6086	6121	0.6	41.3	41.4	0.1
31	425	431	1.4	6130	6078	-0.8	40.6	41.6	1.0
32	437	426	-2.5	6099	6148	0.8	40.9	42.1	1.2
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG15FNL083	206.00		2015/11/6		Loly.Wang		Tim.Yi		



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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	BUB0612MJ-00YUR			
	BUB0612HJ-00W6B			
	BUB0612HJ-00ZNR			

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
1,405	2015/7/15 1:50 PM	2015/9/20 5:04 PM	56	0	2360.0

Representative Test P/N : BUB0612HJ-00AKZ	Current Test Status	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
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Equipment: 1.Oven: E24-T0161

Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (mA) 550 Max.	Final Test Current Spec. (mA) 550 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 5400-6600	Final Test Speed Spec. (RPM) 5400-6600	Deviation (%)	Initial Test Noise Spec. (dB A) 47.0 Max	Final Test Noise Spec. (dB A) 47.0 Max	Deviation 3 dBMax.
33	429	428	-0.2	6090	6049	-0.7	41.4	42.2	0.8
34	433	432	-0.2	6061	6137	1.3	40.7	41.5	0.8
35	433	432	-0.2	6085	6058	-0.4	40.5	41.7	1.2
36	430	427	-0.7	6082	6177	1.6	41.0	41.3	0.3
37	422	420	-0.5	6107	6161	0.9	40.7	42.0	1.3
38	421	426	1.2	6186	6145	-0.7	41.2	41.9	0.7
39	425	425	0.0	6127	6165	0.6	41.4	42.2	0.8
40	425	432	1.6	6072	6089	0.3	40.9	41.4	0.5
41	435	429	-1.4	6147	6043	-1.7	40.6	41.6	1.0
42	432	431	-0.2	6085	6105	0.3	41.0	41.8	0.8
43	424	430	1.4	6002	6177	2.9	40.8	42.1	1.3
44	424	421	-0.7	6090	6075	-0.2	41.2	42.3	1.1
45	477	434	-9.0	5844	6083	4.1	41.4	41.3	-0.1
46	445	428	-3.8	6090	6068	-0.4	40.5	41.5	1.0
47	425	432	1.6	6149	6072	-1.3	40.7	42.0	1.3
48	440	423	-3.9	6085	6158	1.2	41.1	41.7	0.6
49	426	429	0.7	6104	6059	-0.7	40.8	41.9	1.1
50	437	427	-2.3	6096	6182	1.4	41.3	42.3	1.0
51	436	423	-3.0	6105	6273	2.8	41.5	41.4	-0.1
52	431	426	-1.2	6129	6037	-1.5	40.6	41.6	1.0
53	441	437	-0.9	6117	6107	-0.2	41.1	42.1	1.0
54	451	427	-5.3	6135	6105	-0.5	41.3	41.7	0.4
55	429	433	0.9	6146	6125	-0.3	40.9	42.3	1.4
56	429	427	-0.5	6147	6075	-1.2	41.4	41.9	0.5
X-Bar	433.00	429.02	-	6097.77	6106.96	-	41.00	41.80	-
σ	11.13	4.12	-	92.79	59.62	-	0.31	0.32	-

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DG15FNL083	206.00	2015/11/6	Loly.Wang	Tim.Yi